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GENERAL GEORGE ERSKINE, Chairman of Council, in the Chair.

DISCUSSION ON THE MILITARY PRIZE ESSAY, 1893.

("The Military Organization best adapted for Imperial Needs," by Lieutenant-Colonel J. Farquharson, C.B., R.E.[1])

The CHAIRMAN: Gentlemen,—Before we commence the business that is to engage our attention this afternoon, I would, with your permission, say a few words. The discussion is to be on the Prize Essay of the Institution for the current year. I am quite aware that that Essay since its appearance in print has given rise to a good deal, I won't say of irritation, but at all events unpleasant feeling, on the part of the Volunteers and the Militia. There are some statements in it which impugn the usefulness from a military point of view of those two Services, and it is of course not unnatural that any criticisms of that sort, coming from a distinguished officer, should occasion some little unpleasantness. But, nevertheless, I would ask you this afternoon to let your feelings be in abeyance. If you are to deal properly with this Prize Essay you must confute its statements, should you think they are wrong, by means of arguments; and you may depend upon it your arguments will be more efficacious if they are brought forward dispassionately. I feel all the more justified in making this appeal to you, because I am quite sure that, although some of the expressions in the Essay may be considered rather trenchant, it was very far from the writer's intention to say anything that was offensive to either the Militia or the Volunteers. I therefore repeat that I hope that the discussion will be carried on calmly and dispassionately. There is another matter which I should like to touch upon before we commence the discussion. As soon as this Essay appeared in print there were several communications made to different portions of the Press containing statements that the opinions of Colonel Farquharson had received the *imprimatur* of the Council of the United Service Institution. Now that is an entire mistake. If you will take the trouble to read what is on the back of the Journal which appears every month you will see that authors of papers are alone considered responsible for the opinions which they advance. That is the rule, and I do not think that any other rule would be consistent with the object which the Institution has always in view, namely, that of eliciting the truth on matters of naval and military interest and doing so by means of free and open discussion. It is quite clear that if no opinions are to be advanced in papers that appear in the

[1] The Prize Essay was printed in the April number of the Journal.

Journal, except those that have the sanction of the Council, there can be no free and open discussion. Then I observe in some of the communications to the Press that it is said that due care had not been taken in making the selection of the referees for the Prize Essay. Now I cannot understand how anybody could state such a thing as that, for if we searched the Army List throughout I do not think we could have pitched upon the names of three individuals of greater talent and military experience than the three gentlemen whom we asked to undertake the arduous duty—for it is an arduous duty—of adjudicating on the essays that were competing for the prize. Then it was said that they might be able men, but they all belonged to the artillery and engineers. As far as my experience goes, I know of no men better fitted than the officers of those two services for any work of an intellectual character that you may choose to put before them. I do not think that the officers of the artillery or the engineers go about the world with their eyes shut and their ears closed. They can see what is the value of the Militia Force or the value of the Volunteer Force, just as well as any members of the other branches of the Service. Therefore, I think that objection can hold no water at all. I will now ask you to open the discussion.

Lieut.-Colonel HOWARD VINCENT, C.B., M.P.: I will detain the meeting, and yourself, sir, as short a time as possible, and I will endeavour in the remarks I shall submit to the meeting to conform to all the wise advice which you have been so good as to give us. The task of the referees must always be an exceedingly difficult one, but the most difficult task of all, I think, must be the adjudication of a prize of honour among a number of essayists. I will bear in mind the injunction which you have given, and will refrain altogether from any criticism whatever in the matter of the award of this Prize Essay. I will deal with it as entirely as it is possible for me to do by fair argument, and meet its statements as clearly as I possibly can. This is a Prize Essay on "The Military Organization best adapted for Imperial needs." There is an immense deal in this essay which I should like to criticise at considerable length, but of course that cannot be allowed. I find the essay starts with the assumption that the first consideration for the English army is that its strength should be immensely increased for active operations abroad. Anything more absolutely out of consonance with the wishes of the English people of the present day can hardly to my mind be conceived. Let a man be as much a Jingo as he will, and there are those who say I am not behindhand in this respect, no man in his senses, I think, at the present time could possibly share Colonel Farquharson's aspiration that the English army should be fit to be called upon at any time to take an important share in either maintaining or altering the face of Europe. So long as no single Power becomes so dominant as to threaten these islands, or the colonies and dependencies of Great Britain, so long as the gates of the Mediterranean, the gates of the Black Sea, the gates of the Red Sea, the gates of the Baltic, and the neck of the English Channel remain in our own hands, or in friendly hands, we need not trouble, I think, very much about the face of Europe. Indeed the essayist himself practically admits that this is the case, because in two distinct places of the Essay he says that only twice since 1815 has it been necessary for England to send abroad a force of the strength of an Army Corps. It is, however, idle to deny that the statements made by Colonel Farquharson as to the Volunteer Force are those which brought me here to-day, and, therefore, I will refrain from further consideration of the details of the paper, and confine myself to the criticism on that force, with which I have been for a considerable time connected. He has couched his statements in severe and unequivocal language, and he will, I doubt not, as he is here present, allow me in all personal courtesy to combat his statements in precise and exact terms. For one moment I may be permitted to say what is my title to do so. I have for 24 years been a member of this most valuable and excellent Institution, which we are so glad to see, under your auspices, sir, is to open up a wider field of utility for both Services of Her Majesty. My first speech, indeed, was made in this theatre, and after service in the Regular Army and Militia I passed to the command of the regiment now commanded by my gallant friend Colonel Alt, and for the last 9 or 10 years have commanded the Queen's Westminsters. The statements made by Colonel Farquharson are not, it is true, stamped with the *imprimatur* of the Council of this Institution, but they

have been stamped with the highest prize this Institution is able to award. Colonel Farquharson devotes his first chapter to "The Reasons of the Apathy of Englishmen as to Military Organization." Secondly he refers to "The relative Strength and Functions of the Sea and Land Forces of England." Thirdly, to "The Military Organization of the Empire should provide Greater Strength for Active Operations abroad." The fourth chapter is headed, "Defects of the Volunteers and Militia with reference to the Military Organization of the Country." Are we who have been so long associated with the Volunteer Forces not entitled, with all respect and deference, to ask for the credentials of our severe and gallant critic for his wholesale condemnation of the Volunteer Force and the Militia? Whence his knowledge, we ask, of the inner working of a regiment of Volunteers, and whence his experience? And I beg leave to tell him, in the presence of many of my gallant colleagues commanding regiments of Volunteers, that a true knowledge of the force is, I am certain, only to be obtained by service therein, and not even by annual inspections which are conducted with so much ability and fairness, but which knowledge I do not know that the gallant essayist has himself ever had. Colonel Farquharson commences by saying that in the three preceding chapters no account is taken of the Volunteers and Militia, because the country would place no dependence upon them. A very summary way this, surely, sir, of dismissing and annihilating between 300,000 and 400,000 Englishmen, fully armed, fairly officered, and fairly drilled. And what are the grounds for this denunciation? First of all he says that the Volunteer body would certainly in time of war be treated as an "untrustworthy force." Secondly, that the Volunteer Force "has no discipline, and, indeed, no imitation of discipline." Thirdly, that "the important elements of cohesion and self-confidence must be entirely wanting in the Volunteer Force." Fourthly, that "most of the force would not be available except, possibly, at enormous expense, and by dislocating the business of the country, even for home defence;" and, fifthly, and this Colonel Farquharson says is the most fatal defect of the Volunteer Force, that "it is not available for service abroad, or, in other words, for the general defence of the Empire." Now, will the meeting bear with me while I fully, and as briefly as possible, challenge each single one of these allegations made against the Volunteer Force. I might also, Mr. Chairman, call them the libellous allegations. It is, indeed, a novel doctrine that soldiers assembled in tens of thousands of their own free will for the unpaid service of this country are less trustworthy, if properly officered and properly organized, than a body of mercenaries enrolled by the compulsion of law enforced by police and by prisons, or by compulsion of the stomach and of the empty pocket. If this were true as a general proposition, and if it is true of a military body, it is true of every civil body. Then the Egyptian forced levies would be superior to voluntary labour, and a body of African slaves, panting for freedom, would be superior in their quality for labour to English workmen competing of their own free will for employment. This statement as to the Volunteer Force not being trustworthy is, I submit, not the lesson of history, not the lesson either of present day economics, and it is not the teaching of England or of English life, because it is the Volunteer spirit in England and in English life which has made this English nation pre-eminent throughout the entire world. But the definite statement of Colonel Farquharson that the Volunteer Force has "no discipline, and, indeed, no imitation of discipline," I think, is the most serious of his many allegations. I deplore the stamp of authority even given to it by the award of the Prize Medal of this Institution, and I deny this allegation as to the want of discipline in the Volunteer Force. I know that the iron discipline of the Peninsular period, which Colonel Farquharson might possibly have in his mind, does not prevail in the Volunteer Force; neither does it happily prevail in the British army at present, or in the Royal navy. The authorities now know that the lighter hand with which discipline is now so well maintained in the British army and navy is far more effective than the desertion-encouraging discipline, the iron discipline, the cat-o'-nine-tails discipline, of former times. Under the wise regulations also lately promulgated by His Royal Highness the Commander-in-Chief, we know that a well-behaved man may be just as good, and indeed a better, soldier of the Queen at the present time, without being put to bed at 9 or 10 o'clock, without being forbidden to smoke in the streets, or to wear

his great coat, and without being court-martialled for every trivial offence. It is true that the Volunteer cannot be imprisoned by his commanding officer, he cannot be confined to barracks or given pack drill by his captain unless he is in camp and serves with Regular troops, but if needs be a Volunteer can be punished far more effectively. By his commanding officer alone, and without any appeal to military authorities, he can be dismissed from the force, and can be sued in the police court for the money lost to his corps from the uncompleted portion of his three, four, or five years' service. That is the civil contract that every Volunteer, or nearly every Volunteer, enters into with his commanding officer. What does dismissal mean to the Volunteer? It not only means dismissal from the ranks of the Volunteers, but also dismissal from civil employment, either by his master's act, or far more effectively by moral pressure of comrades; and thus I say that a regiment of Volunteers is what a commanding officer himself makes it. In camp and in field, in mobilization, it is subject to the same enforcement as in the standing army. And more than this, a man joins the Volunteers from a sense of respect for authority, and not because he is pushed for a copper. He brings his entrance fee with him; he binds himself to an onerous engagement, and although in every body of men there are necessarily black sheep, and deficient intellects, the great majority of the Volunteer Force have, I believe, from my own individual experience, an ingrained sense of discipline. I shall not detain you much longer, but if the meeting will give me three minutes more I shall be able to deal with the other points. Our essayist says it is "fair weather discipline" only, and it would not stand "the test of hardship, of poor fare for months, of perpetual vigilance before an enemy." On what basis, I want to know, does Colonel Farquharson ground this statement? Where the hardships, the poor fare for months, the perpetual vigilance before the enemy are coming in, unless the military authorities of the future are far more incompetent than those of the present time, I do not know. The hardship and poor fare for months are, mark you, to be in an English garrison, and if an enemy is going to operate for months, in what an eminent politician has called upon many platforms "sooty little England," there will be very little left of him, I think, at the end of a few months. Again, who stands hardship best, the man who has been cultured from his childhood and youth or he whose cradle was the gutter, and who struggled into manhood——

Colonel LONSDALE HALE: I must call my friend to order. Are we to hear that the men of the Regular army were cradled in the gutter?

Lieut.-Colonel VINCENT: I make no charge whatever against the men of the Regular army; but what I do say is this, that Colonel Farquharson has no right to say that the Volunteers cannot stand hardships. If, however, my remark is understood in the sense taken by Colonel Lonsdale Hale, I withdraw it.

Colonel W. J. ALT: I think Colonel Howard Vincent will withdraw that remark.

Lieut.-Colonel VINCENT: I will withdraw it to the fullest extent, but what I do say is that Colonel Farquharson has no right to say that the men of the Volunteer Force would not be capable of equal endurance in the field with the men of the Regular army. A hundred men in this theatre could, I believe, support hardship and support starvation far better than the men whose childhood had been less carefully attended to. But Colonel Farquharson denies that that cohesion and self-confidence, which is necessary in every military body, exists in the Volunteers. Let me tell him that I believe that that cohesion and confidence exists far more in the majority of Volunteer regiments than it does in the same number of regiments of the Regular army, and for this reason, that the men of a particular Volunteer regiment are drawn very largely indeed from the same class, from the same Government office, from the same mercantile office, and, perhaps, from the same works. They know each other, they believe in each other, and it is that knowledge of each other from the earliest days, and the acquaintance with their families, that gives that cohesion to the Volunteers that Colonel Farquharson denies. Then Colonel Farquharson says that most of the force would not be available, save at an enormous expense by dislocating the business of the country. Does anyone in this theatre, does Colonel Farquharson himself, assume that if an enemy were about to invade these shores, our ordinary life would continue, that the banks would continue to do business, that the Law Courts would continue to

do business, that the "bears" on the Stock Exchange would continue to play with the "bulls," and that ordinary life would not be dislocated by the very fact of the appearance of the enemy upon our coast? And this fact alone is sufficient to show that millions of men would be available for active service if the Volunteers were called upon. There is only one point more, and that is the complaint that the Volunteers are not available for service abroad. I agree with him, and I grant to him the opinion of many commanding officers that the Volunteer Act requires amendment to enable the military authorities to have greater power to call upon the Volunteers in cases of necessity. But the essence and principle of the Volunteer Force is that it should be for the defence of the mother country. If it is available for the heart of the Empire, it is assuredly then available for the general defence of the Empire, because if the heart of the Empire, if the mother country, falls into the hands of the enemy, of what use are the outer portions of the Empire? It is difficult indeed, Sir, to deal with all Colonel Farquharson's statements in the brief time that you have been so kind as to allot me. I do not doubt that my colleagues here will take up the points that I have neglected, and will repudiate, on behalf of the force to which I belong, the statements which have been made. I believe on insufficient knowledge and insufficient experience, by the Prize Essayist.

Colonel J. DUNCAN: I should like to offer a few remarks on the Prize Essay. From some of the criticisms which have appeared in the newspapers it would seem as though the Council had made a mistake in not insisting upon the condition that the essay awarded the prize should "prophesy unto us smooth things." At any rate, the critics to whom I refer seem to think that no essay should have been awarded the prize that did not prove our existing military organization to be the one best adapted to Imperial needs. Now, the Council could not, in my opinion, have selected a military subject of more vital importance to us as a nation than that of the Prize Essay, and I think they were wise not to hamper the subject with any such conditions as those I have mentioned. The referees also appear to have kept their minds free from any such hampering conditions, for, besides the Prize Essay, they have honourably mentioned three other essays widely differing from the Prize Essay as well as from each other, so that this important subject can be seen from four different points of view. As one of the competitors whose essays were honourably mentioned, I hope I may be allowed to say that, so far as can be judged from the essays that have been commended, the referees appear to have carried out their duty of awarding the prize with perfect impartiality. Although there are many points on which I cannot agree with the writer of the Prize Essay, I think he has shown very clearly and very ably that strength on land is a necessity of existence for a Power of the first class. Our navy is, of course, of the greatest importance; but, to reap the full benefit of our strength by sea, it seems essential that we should be able, if need be, to assert ourselves also by land. As regards the Volunteers, we, as a nation, owe them a debt of gratitude which we can never adequately repay. They sprang spontaneously into existence at a time of great national danger, and thereby averted from our shores the direst of all possible calamities—an invasion of the country. They have ever since remained faithful to the offer of their services, and have gone on steadily improving themselves in organization, discipline, and training; but the original danger having passed, it seems to be a matter for serious consideration whether the Volunteers as at present constituted are the kind of force best suited to our needs, particularly in view of the strides with which military science has lately been advancing. I am aware that the Volunteers are quite willing to take upon themselves greater obligations than those they already bear. They are imbued with an excellent spirit, and, so far as they themselves are concerned, no one, I think, would wish to say one word against them; but it is, of course, impossible that a force constituted like the Volunteers could be so reliable from every point of view as a force entirely at the disposal of the military authorities. As pointed out by the Prize Essayist, and also by one at least of the other essayists, many of the Volunteers belong to professions and trades from which they could ill be spared in the event of war, while others would enlist in the Regulars, and this would all tend to disorganize the force. Then the discipline of such a force as the Volun-

teers must necessarily be somewhat weak. It could not, in the nature of things, be otherwise; but I do not agree with the Prize Essayist in saying that they have no discipline and no imitation of discipline. If they do not possess the genuine article, I think they have a very good imitation of it; in fact, I would go further and say that they have a fairly good discipline. But to my mind the most serious element in the constitution of the Volunteer Force is the inequality of the tax it imposes. I have never been able to understand clearly the process of reasoning by which we propose to throw the tax of defending the country upon the Volunteers, while the rest of the manhood is exempted from sharing the liability, and I think this is a point well worthy of serious consideration. The remarks that Colonel Howard Vincent has just made, to the effect that trade and everything else would be dislocated by an invasion, appear to me to emphasize this point, for while the Volunteers would be engaged in defending the country, there would be others, who ought to be similarly engaged, doing nothing towards that end. My idea is that every able-bodied man should be, so to speak, a Volunteer. This would, of course, mean conscription in some form or other. But I know it will be said that this country would never stand conscription in any form. Perhaps not; but has the country ever seriously considered the question? There are hundreds, nay thousands, of people ready to swear by the Volunteers, not because they have seriously considered whether or not such a force is the best suited to our needs, but because the existence of such a force relieves them of their proper share of the blood tax. I think the Volunteers will understand that what I have said on this head is all to their credit. Were it not for the existence of this force, the people I refer to would have to pay either their share of a large increase of the Regulars or their share of personal service. As regards the Prize Essayist's proposed military organization, I will only say that I cannot go with him at all, for, apart from the complication of having three separate armies, each raised by Volunteer enlistment, I do not think it would be possible to get in that way the number of men that would be required for the purpose. I will only add that if the publication of the Prize Essay and the essays honourably mentioned has the effect of causing our military organization to be seriously considered, a very good purpose will have been served, and the Council of the Institution will have cause to congratulate themselves upon having effectually drawn attention to a matter which must always be of the very utmost importance to us as a nation.

Colonel ALT: It is to be regretted that the discussion on this essay was not fixed at an hour more convenient to the bulk of officers of Volunteers, when I think the attendance would have been much larger, for I need hardly say that the manner in which the Volunteers are alluded to has sent a thrill of indignation through the entire force, and loth as we may feel to take any notice of these remarks, it has been represented that it is incumbent upon us to do so. Lieutenant-Colonel Farquharson has chosen to brand the Volunteer Force as absolutely unreliable, and unfit for the purpose for which it was raised, and for which it has laboured for 33 years, through evil report and good report, to perfect itself. He has deeply wounded the feelings of every man in the force to whose knowledge his utterances have come, but he has not damped our spirits, and his aspersions on our character will have no effect upon our patriotism, nor upon the soldierly qualities which, in my humble opinion, now characterize the force. In order that there may be no mistake as to what we object to, I will just quote some of the sweeping assertions applied to us. In Chapter 4 Colonel Farquharson says: "The omission to take us into account in the effective land forces of Great Britain was a deliberate one." The movement "in its inception was at least a patriotic one, and even now serves to promote the physical training of the youth of Great Britain." "In time of peace the country treats the Volunteer Force as trustworthy, but in time of war it would certainly be treated as untrustworthy." "Its first defect is that it has no discipline, and no imitation of discipline." "The fair-weather discipline is no doubt good, but what it would be under the test of hardships, poor fare, &c., is another t ing altogether, and, indeed, there have been cases where, under the pressure of even a few days of bad weather, and the consequent idleness, the usually good conduct of the men has broken down. In such cases the officers are, of course, quite helpless." "It is doubtful whether the fact that such

a state of indiscipline exists in a force which claims to be really a body of soldiers does not react injuriously on the men of the Regular army." "The elements of cohesion and self-confidence are entirely wanting." "Its duties are merely a diversion," and, with regard to our mounted artillery, "no dependence could be placed on such a force." "If summoned to resist an invasion, they would probably arrive too late." "There are probably only two categories of Volunteers who could be really utilized for active service, viz., the London Volunteers and the corps who live in the seaport towns." No doubt some provincial commanding officer will be able to say something upon that point. Then, again, he says, "It is only mischievous to tell us that we properly rank as soldiers." If there is anything which we pride ourselves upon, it is being citizen soldiers in every sense of the term. Then again, "No confidence could be placed in us as a field force." And finally he says, "General Sherman's description of the Union Army at the battle of Bull's Run exactly applies to the Volunteers of Great Britain. 'We had good organization, good men, but no cohesion, no real discipline, no respect for authority, no real knowledge of war.'" Now, sir, I think such words justify me in characterizing them (1) as untrue in fact; (2) as the outcome of complete ignorance of the present state of the Volunteer Force; and (3) as a libel on the officers and non-commissioned officers and men composing it. I will say nothing regarding the award by the judges of the Gold Medal to an essay containing such remarks as these—that phase of the subject will probably be dealt with by others. Whatever we may think of the taste or expediency of the choice, there may be academic reasons for justifying it, but they will not lessen our astonishment at the prize having been given for such an essay. In saying that in its inception at least the Volunteer movement was a patriotic one, the essayist implies that at the present time the force is *not* actuated by that virtue. Then as to the youth of Great Britain; has the essayist ever attended any of the inspections or marching columns or Easter or Aldershot drills of Volunteers, and has he studied the late reports of the Inspector-General of Recruiting, or has he been brigaded or marched with, or even been in a garrison town with, any of our boy regiments of the Line? I am afraid not, or he would hardly imply that it is the Volunteer force which represents the youth of the nation. Then it is said that we are an "untrustworthy force." Under this indictment it is, I think, sufficient to refer the essayist to the many utterances of general officers and brigadiers who have commanded troops in the field, and who have so frequently expressed their approval of the discipline, steadiness, and general soldierly behaviour of the Volunteers, which utterances were lately summed up in the statement of a colonel of the Guards, who declared that he would be proud to lead the Volunteer battalions under his command against the enemy by the side of his own regiment of Guards. Either these distinguished officers are guilty of the meanest and most dangerous flattery, or the essayist's statements are untrue. ("Name.") Colonel Gascoigne. I thought the argument would be sufficient, and that what I stated would be generally known. Then he says, "There is no discipline, and no imitation of discipline." If the essayist's statements regarding the discipline of the force had been made 20 years ago, I doubt whether there would have been any justification for them, but for such a sweeping accusation to be made at the present day is most unjustifiable. I have seen British troops in the field and in garrison in the four quarters of the world; I have seen the troops of Continental, American, Turkish, and Asiatic nations; I have commanded Volunteers for over 20 years; and I have been brigaded annually for nearly that number of years with troops of our own Line, and I have never during the whole of that time had a single complaint made of want of discipline, but, on the contrary, have frequently been complimented for the steadiness and perfect discipline of my command. I do not claim anything exceptional in saying this. There are degrees of discipline amongst the regiments of all armies, and there may be some better Volunteer battalions than those I have commanded, and there may be some not so good, but in no respect can I admit that as a whole the discipline of the Volunteer force is now inferior to that of our Regular army, or of any other Regular army. I go further and say that we have inculcated and taught discipline to the nation, and have not undermined it. The discipline of the army has not been lowered as compared with

40, or even 20, years ago, and the example of the million civilian soldiers who have, from motives of the purest patriotism, devoted their time and money to the formation of a barrier against invasion has had the effect of showing that an army can be organized and strict discipline enforced without the necessity of shutting men up in barracks under prison rules, and without the infliction of cruel and excessive punishments, and it is us that the British Line soldier has to thank to-day for the amelioration in his condition. I will make no comparisons or allusions to the state of discipline of the Regular forces. The chiefs of the army are fully capable of maintaining this first of military essentials, but the cruelest blow of all aimed at us by Lieutenant Colonel Farquharson is his remark that we "have no cohesion, no real discipline, and no respect for authority." Now, with regard to "cohesion" and "self-confidence" being entirely wanting, it is really hardly necessary to comment upon this. For the Nile campaign, detachments culled from several different regiments, and formed into one body, were launched with success against the bravest savages ever encountered, and yet Volunteers who are all drawn from one town or district, generally from one special class of employment, who all, more or less, know one another, and are constantly together in social regimental intercourse, are to be branded as having no cohesion, and as being only occasionally associated with their comrades. "Most of the force would not be available" is another statement. This is also not true. Upon the issue of an order to mobilize, every man whose name is down on the muster roll of his regiment would be bound to turn out, and I am convinced that every man in the force is serving with this knowledge. If in the day of the nation's danger the authorities hesitated to call into full play our services, I believe it is the force itself that would demand to be summoned to the front, wherever that front might be; and as to our arriving too late, I say here that 24 hours' notice is all that is required, and if, when assembled, Volunteer brigades were not ready to move, it would not be the fault of the Volunteers, but of the authorities who failed to provide transport for us, or pay us the moderate grant necessary to enable us to supply ourselves. Then it is said, with regard to the Volunteer batteries of mounted artillery, that no dependence could be placed on such a force. I leave my friends the Volunteer gunners to answer this aspersion, remarking only that in my opinion one of the wisest acts of the late War Minister, Mr. Stanhope, was the authorizing the raising of Volunteer field artillery. Time compels me to bring my remarks to a close. It will be for the judgment of this meeting, which you, sir, will ably sum up, to say whether there is any justification for applying to us General Sherman's description of the Union Army at the battle of Bull's Run, viz., that we have no cohesion, no real discipline, and no respect for authority. In conclusion, I venture to say that if it could be permitted for Lieutenant-Colonel Farquharson to draw by lot the number of any battalion in the Regular army, and for me to draw by lot the number of any Volunteer battalion in the kingdom, I would take my Volunteer battalion and march it, and billet it, and bivouac it from one end of the kingdom to the other, in any season of the year, and for any length of time, and I would stake as much as ever he liked to stake that there would be nothing to choose between those battalions on the score of good conduct, endurance of fatigue and hardships, and all that goes to make perfect discipline. I do not say more than that, but I will not admit less, for our only ambition is to make ourselves and the force we command a fit component part of the glorious army which has built up this great Empire to which we belong. I say, therefore, that the essayist's remarks regarding the Volunteer force of Great Britain are untrue in fact, are the outcome of ignorance, and are libellous and unjust—

> "Who steals my purse, steals trash.
> 'Twas mine, 'tis his, and has been slave to thousands.
> But he that filches from me my good name,
> Robs me of that which not enriches him,
> And makes me poor indeed."

Colonel H. H. A. STEWART: Having heard the remarks of two or three officers of Volunteers, perhaps gentlemen would like to hear some observations on the Prize Essay coming from a Militiaman. It is not often, I believe, that a Militiaman addresses

you here. We do not want to advertise ourselves in any way. We believe that the force or regiment that is least heard of is the best. I have served 20 years in the Regular army, and as adjutant of my regiment for six or seven years. I have also served for 10 years in the Militia, and I am as proud now of wearing my county Militia uniform as I ever was when I wore the kilt of a gallant Highland regiment. Confining my observations exclusively to the Militia, I shall refer to what Colonel Farquharson has said with regard to that force, and I may say at starting that his remarks are advanced without a jot or tittle of evidence to found them upon. He says (*a*) that "no account is taken of the Militia, and that the omission is deliberate." He evidently meant what he said. (*b*) "The country would place no dependence whatever upon the Militia" (in case of invasion). (*c*) "The Militia"—I apologize for comparing them at all with the Volunteers or Regulars in any way, but Colonel Farquharson forces me to do so—"is more valuable than the Volunteers." (*d*) "When embodied, the Militia come under the Army Act." (*e*) "After six months, probably they will be fit to be put in line with the Regulars." (*f*) "Not fit to take part in the defence of the Empire immediately" (but they would *probably* be so after six months!). (*g*) "In time of war, if the strain were great, it would be possible to have the Militia embodied." Now, sir, the writer hits very hard, and he hits very recklessly, in his statements; and, not only does he violate English grammar and composition, but he treats with contempt the more salient facts of the history of the Militia, which facts, I maintain, are in absolute and complete refutation of his statements. I will attempt to prove that. Now, as regards (*a*), it speaks for itself. Colonel Farquharson considers the force useless, an encumbrance, a mere wicked waste of money; (*b*) refers, as far as the statements go, to an invasion and to the value of the Militia in case of invasion. This is important. I am unaware of there having been more than one invasion of any portion of the United Kingdom since the days of William the Conqueror, namely, the invasion by the French of the west of Ireland. Who repelled that invasion? *In the first instance the Militia repelled it. And when the French* advanced a second time, who do you think repelled them, gentlemen? The wives of the Militiamen! And do you know how it was? It was thus: the French got such a beating from the Militia a few days before, that when they took heart of grace and advanced again, and saw a lot of Militiamen, as they thought, in red clothes (but they were the wives of these soldiers—fisherwomen in their red petticoats), they bolted for their lives! Now, as regards (*c*), "the Militia is a more valuable force than the Volunteers." That is a very remarkable opinion, especially on the part of a scientific officer. To be *more valuable* presupposes that the force, or whatever he makes the comparison with, is *valuable*; but what does he say? He says that no dependence is to be placed upon the Volunteers—"they have no discipline or imitation of discipline." He gives four or five different headings that I will not weary you with, but any one would be enough to damn, in Shakesperean language, any force on earth. He will explain that afterwards to us, no doubt. Then (*d*) Colonel Farquharson says, "When embodied (the Militia) come under the Army Act." Now it is palpable to anybody here that he cannot possibly understand the subject, when he says that; because the whole of the officers and permanent staff of the Militia[1] are under the Army Act all the year round, and for three months of the year a large proportion of the Force, namely, all the recruits, and for four weeks[2] every year the whole of the Militia of the United Kingdom, are under the Army Act. He evidently does not know the difference between "embodiment" and "calling out for training." That is a comparatively small point. Now we come to (*e*). Having compared the Militia with the Volunteers, he is not satisfied, but he hastens to compare them with the Regulars. I will join issue with him there, as an old Regular, and I will descend from the abstract and

[1] A few members of the permanent staff have never served in the Regulars. My experience of these is that, in 10 years, I have never had to find fault with one of them.—H. H. A. S.

[2] A considerable proportion are so under the Army Act for five or six weeks annually.—H. H. A. S.

general of the essayist to the concrete and particular in what I have to say. And this I hope will not cause offence to any officers of the Regular army present, but, as Colonel Farquharson—an officer of the Regular army—sees fit to hit the Militia as hard as he likes below the belt, and in absolute ignorance of the force, I claim my right to say what I have to say plainly but properly. I will read to you a few remarks as regards the Militia from a lecture delivered by a brother Irish Commanding Officer of a Militia regiment, Colonel Dickenson, of the Dublin Militia. He delivered this lecture before Lord Wolseley, the Commander of the Forces in Ireland, last year: "From a little work entitled 'The Royal Militia and Yeomanry Cavalry' have been extracted the following records of some of the events connected with the Militia during the French war in aiding the Line—and quite apart from the legitimate duties of the Militia in the United Kingdom during the same period—during the Irish Rebellion, and opposing the French in the west of Ireland. The 6th Royal Cheshire Regiment sent 1,598 men to the Peninsula; the (21st) West York sent 1,800 men.[1] . . ." At Waterloo, too, I believe I am correct when I say that the Duke of Wellington stated that a large proportion of the troops that won that battle were young Militiamen.[2] Sir, it is a fact that cannot be refuted, that so far from taking "six months to put the Militia into 'line' with the Regulars," if it had not been for the Militia there would have been *no "line" whatever for the Regulars to form upon in the field*. In the Crimea, between 30,000 and 40,000 Militiamen joined the army, and at the Battle of the Alma there were not more than 25,000 British troops present. At Inkerman there were not so many,[3] and when the Russian General Luders inspected the British army at the conclusion of the war, only 29,000 soldiers marched past him. Where would have been the English army in "line" in the field in the Crimea but for the 32,000 or 33,000 Militia that went out to join it? The same may be said in the Indian Mutiny, so that, for the last century, if it had not been for the Militia, there would have been no line for the Regulars to form upon. Now I descend to the concrete and particular. First, I will say that the bases of discipline and efficiency are *first*, good conduct; *second*, good health; *third*, good physique; and, *fourth*, an adequate knowledge of, and proficiency in, their duties. I maintain that the Militia, in spite of discourtesy, neglect, and discouragement shown to them by the authorities, possess all these qualifications, and some of them in the most marked degree. During the recent training of my regiment of Militia (and I have high authority for saying that this small percentage of sick is general in Irish Militia), I compared the number of sick amongst the permanent staff (of course picked soldiers of the Regular army sent to instruct us in our duties) with the sick Militiamen: there was but one Militiaman in proportion to 15 of the permanent staff on the sick list; that is, for one man sick on the permanent staff, there was only one-fifteenth of a man of the Militia sick. Out of about 400 men up for training there was only an average of four Militiamen, or a little less, in hospital. There were two, three, or four of the permanent staff absent from their duties from the same cause throughout the whole time of training—27 days, and out of a total of 22 or 23 men! Moreover, owing to the mercurial disposition of Irishmen, two of the four in hospital were Militiamen suffering from cracks on the head, owing to their way of settling disputes among themselves. Now as regards the behaviour of the Regular troops—the only ones that I can compare the Militiamen with, namely, the soldiers of the Regular army sent to instruct us in our duties—the proportion was about one-fifth or less of the Militiamen to the prisoners of the permanent Staff;[4] that is, sergeants, trumpeters, and drummers of the Regular army sent to us to teach us our duty. I must not trouble you further.[5] I have a great deal more

[1] Many Militia regiments volunteered for the War in the Peninsula, and several served in the South of France, *e.g.*, Bucks, Denbigh, Derby Militia, &c.—H. H. A. S.

[2] Dressed and equipped as Militiamen. This was also the case in the Peninsular War, notably at Talavera.—H. H. A. S.

[3] 22,000.—Kinglake.

[4] Quoting from inspection parade state.—H. H. A. S.

[5] Colonel Stewart had already exceeded the 10 minutes allowed to a speaker.—Ed.

to say, and perhaps the Council will give me an opportunity of delivering a lecture on the Militia at some future day.

Colonel J. S. CAVE: I am one of those who believe that it is very much to be desired that the land forces of the country should be improved, both in numbers and efficiency, and therefore I cannot but regret anything that could in any way militate against such a consummation. But I am quite sure that that will be the effect of arguments that are based upon false premises. Some of the arguments in the Prize Essay, I think I am right in saying, are based upon faulty premises. I will confine myself to the remarks with reference to the discipline of the Volunteer Forces. Colonel Farquharson says we are without even a semblance of discipline. The only premise for his statement that I can gather from his essay is that we are never embodied, and that we cannot order our men to attend drill. I have myself been out with my battalion on permanent duty under canvas for eight months, not, I admit, from the 1st January to the 31st August, but in periods varying from a week to a fortnight, during the last 28 years. There seems to be an idea that unless good conduct and obedience to authority are brought about by a fear of punishment it is not discipline. I would ask Colonel Farquharson if he does not consider whether, if obedience to authority is brought about from a sense of duty, confidence in superiors, and *esprit de corps*, it is not equally discipline?

Major H. W. PEARSE, East Surrey Regiment: I only wish to say three or four words to point out what I think is an error in the calculation of Colonel Farquharson as to the cost of introducing the organization he proposes. He estimates the total additional cost will be 4½ millions or rather more, but to meet that he deducts the total cost of the Militia, Yeomanry, Volunteers, and Army Reserve as they now exist, showing a balance additional cost of about 1,000,000*l*. One of Colonel Farquharson's strongest points is that his proposed organization might be adopted, because the country would not object probably to the addition of 1,000,000*l*. to the Estimates. I think his remarks in his first chapter imply that a large addition would undoubtedly be objected to. This shows very clearly that the adoption of the organization depends on its excess cost over that now in existence not being much over the 1,000,000*l*. calculated by Colonel Farquharson. The country, however, could not depend on the new army proposed by him for several years, until it was formed and until its Reserves were formed. In the meanwhile it must keep the Militia, and Volunteers, and Yeomanry, and consequently must pay for them. I say nothing about the Reserves, because they would remain, and would be part of the new Reserve. My point is that for ten years a good part of these 3½ millions which Colonel Farquharson knocks off would really still have to be paid by the country. This, I submit, would be a very great difficulty in the way of adopting the organization Colonel Farquharson proposes.

Colonel S. G. BIRD: I should not have taken any part in this discussion except that I am rather on my own defence. I have had so many letters from Volunteer officers taking me to task for not having protested against this Prize Essay being published by the Council that I thought I ought also to point out, as has been already explained, that the Council had nothing whatever to do with the publication of the Prize Essay. With regard to the essay, I think we ought to admire Colonel Farquharson very much, for he seems to have the courage of his opinions: he lashes out at everybody all round, not only at the Volunteers but at the Regulars, whose ire he has also raised. If his criticism is true, we ought to be thankful for it; but I think it it has been pointed out very forcibly by most officers who have spoken that he is wrong in his premises and in his arguments. I regret that there are not more officers of the Regular Force here, for I think we might very safely leave the character of the Volunteer force in their hands. I cannot help thinking there must be a very great deal of eating of words some day very soon, because if Colonel Farquharson is such an authority upon the value of the different forces which he has thought proper to criticise, what are we to say about the Commander-in-Chief, and about the Adjutant-General? What is the worth of their opinions? Those officers have given opinions about the force at different times. As I have said before, either he or they must eat their words. Evidently a great many people have been living in a fool's paradise for a good many years. I cannot

help thinking what a fool I have been all these 30 years to think I have been trying to make a soldier of myself; I have given up my time and my pleasure, I have spent hundreds and thousands of pounds for this force, and during all this time I have been making a fool of myself. It is all very well to laugh, but it is a most serious thing, because it is not only that we have to think what a fool's paradise we have been living in, but what a fool's paradise the country has been living in. Who is to be responsible for the three-quarters of a million annually spent upon this force to make us into soldiers? Some one will have to give an account of that some day, because the British public will want to know why they have been spending all this money if we are such a worthless force. Now, on the question of discipline, I entirely disagree with Colonel Farquharson. I do not think he can possibly know anything at all about the Volunteers: if he did he certainly would not have ventured such opinions. Colonel Cave has justly said that the discipline brought about by good feeling and moral suasion must be better than discipline brought about by the fear of the Army Act, and in that I quite agree with him, and that is the opinion, I think, of all Volunteer officers. I have had command of a provisional battalion at Aldershot for several years, and I may say with pride to the force and to myself, which I hope may be pardonable, that never once have we left a man behind at Aldershot in the cells, nor has one been punished. I have never had to punish any man beyond probably confinement to camp for some very trivial offence. I would ask any one to compare the conduct of the Volunteers with that of the Regular Army. Can you say that the moral power you have over the Volunteer is not better than the power you have over him by punishment or by means of the Army Act? Then, as to endurance, Colonel Farquharson says we are a worthless body. Now in this same battalion we had some very hard work three years ago, some very hard marching indeed. On some days we marched 25 miles and on one particular day when we marched nearly 30 miles word was passed down the ranks, not by me, that no man was to fall out, and when we came back our ambulance wagon was empty. That could not be said of the Regular battalions in the same brigade. Therefore, considering that these men are taken away very often from shops, from behind the counter, and from offices where possibly they may not have had the amount of physical training they would have in the army, I think it must be very greatly to their credit that they are able to do the work that they have to do; and I have yet to learn that a man who is better educated and trained does not make a better citizen soldier than a man who possibly has not had the same advantages. If the Volunteers were ever called up, I cannot help thinking our Volunteer army would be licked into shape a good deal quicker than any other force you can possibly name, from whatever class it may be taken. I would appeal to my brother Volunteer officers whether it would not be better to leave our characters in the hands of some Regular officer. I should be perfectly content to leave it in your hands, sir, for I remember being inspected by you, and remember you made some very flattering remarks about the regiment. That was a very long time ago. The Volunteers have improved very much in discipline since then, and I shall be very glad to hear from you or some officers of the Regular force what they think of the force. I do not think it is quite fair that we should be put on our own defence.

Lieut.-Colonel A. GRUBB: It was my fortune to take part for three years in the New Zealand War which occurred several years ago. That war was sprung upon the country very suddenly. The forces of the country were called out, and they were practically Volunteers; they were called Militia, but they were really Volunteers. They were embodied, and I was brigaded with these in various camps, and certainly I can recall no instance of indiscipline or bad conduct during the time they were embodied. They did not engage in any action in which I took part, but they held the ground behind us, which Volunteers would probably do in any great event in this country. There has been so much said about the Volunteers to-day that I do not think it necessary for me to speak further in their favour, except to add that, as adjutant of the Auxiliary Forces for several years, I saw something of the Volunteer artillerymen, and I can testify to the earnestness of the Volunteers in performing their duties, and to their uniform discipline. In reading the Prize Essay, I was very much surprised with the part reflecting on the Volunteers, but,

while I say that, I do not mean to infer there is not a great deal for us to learn from the lecture we are now discussing. There are some matters we may dissent from, but there is a great deal with which one can agree. The essayist says, no doubt wisely, that the country ought largely to increase its army. Wherever we have undertaken naval expeditions, they have been carried to successful issue where we have had the army to step in and complete the work, such as in Egypt. When Portugal was rather unpleasant, the mere exhibition of the fleet before the shores of Portugal was sufficient to bring her to her senses, not long since. We were successful in the Chinese campaign, because we had a land force to supplement the naval. The French were not successful in Siam because they had a navy and no army to follow. The essayist lays great stress on having the army strong to supplement the navy, and every one will agree with him that this should be so. No doubt he has rubbed up the Volunteers the wrong way, and I think he is very much mistaken in reflecting on them as he has done. The discussion has been so ample that any further remarks from me seem almost unnecessary.

Colonel C. H. COLES: Naturally, in a case like this, one must to a certain extent traverse ground that has been gone over before, but one cannot help reverting to this question of discipline, which seems to have hit us all so hard. The essayist observes, as we all know, that the Volunteer Force "has no discipline, and no imitation of discipline." When I first read that, I began to ask myself what "discipline" really was, and I looked up two or three authorities to find out what was the meaning of the word. General Hamley and several other gentlemen give their definitions of "discipline," and a gentleman, whose name is not given, sarcastically observes that it is the "art of inspiring soldiers with more fear of their own officers than they have for the enemy." The essayist says, "It is not possible that men who are begged, and not ordered, to attend parades or drill can have anything in the nature of discipline." It is not possible to compel Volunteers to attend every parade, except the inspection parade, but the ideas of discipline which men learn in private parades bear fruit when the regiment goes into camp, or into barracks. Crime, as every Volunteer officer will bear me out, is conspicuously infrequent, and serious cases are punished by dismissal, which we all know is a power only granted to Volunteer commanding officers. Discipline is judged by results, and when one sees men properly dressed in the streets, or turning out smartly on parade the morning after a long, perhaps wet, day's work, one cannot but recognise that these men have learnt something in the nature of discipline. One cannot help fancying that the essayist's remarks were too hurriedly penned, and he appears to have been unaware of the existence of Section 176 of the Army Act, 1881, which we all know means that Volunteers are subject to military law, under certain circumstances. We find the essayist says it is not made a *sine quâ non* that they should be placed under the Army Act for discipline, but we all know the section of the Army Act, 1881, and it is no use my quoting it here. The essayist says, "A scheme was inaugurated by the late War Minister for raising Volunteer batteries of mounted artillery—probably the duty which of all others requires the most thorough military training. No dependence could be placed on such a force." I am not myself a mounted artilleryman; I am a garrison artilleryman. I will just read two lines from the proceedings of the Royal Artillery Institution in March, written by Captain G. Osborne, R.A., entitled "Volunteer Adjutancies." "The Volunteer batteries of position are now harnessed with R.A. harness; staff sergeant, Nos. 1, and drivers and officers are mounted, and in many cases are turned out in a serviceable and soldierly way, smart in every respect, and are no mean followers of the British field artillery. This perfection has not been arrived at without considerable difficulty." As regards garrison artillery, we fortunately have escaped criticism, as far as I can see from this essay, except that it is stated that we have "no discipline, or even an imitation of discipline." In "Garrison Drill," vol. i, the artilleryman's red book, there is a chapter devoted to Militia and Volunteer artillery, the positions which they are to occupy, the duties which they are to perform side by side with Royal Artillerymen, in which I suppose we should not be allowed to take part if we had "no imitation of discipline." On page 348 there is a remark which I am sure has caused pain, as well as annoyance, to every Volunteer officer: "It is not very surprising that they," that is the soldiers of the Regular army, "should some-

times consider themselves justified in adopting some of the methods of a force which can only be kept in existence by the 'popularity' of its officers, and which has no scruple on occasions in indicating to an officer, in methods which would hardly meet acceptance in the German or French or Russian armies, that he has not succeeded in meeting with their approval." Again, on page 349, I read the description which General Sherman applies to his Volunteers at the Battle of Bull's Run. I do not think that any Volunteer officer would allow that aspersion on the non-commissioned officers and men of the force to pass without some remark. I can only say for myself that I have had 23 years' experience, and I have never heard of a case where there was this want of respect for authority, and I think commanding officers of Volunteer regiments here will tell the same story. I think that this is an aspersion cast on the non-commissioned officers and men of the Volunteer Force which is not justifiable.

Colonel A. FEATHERSTONHAUGH, R.E.: It seems to me that the essayist pitched rather a high note when he said that Volunteers have no discipline, or words to that effect. I am willing to think, however, that he does not use the word in exactly the same sense as the gentlemen who are justly aggrieved by the statements which have been made. When it was said during the Franco-German War that there was no discipline in the French nation, what was meant was that discipline did not rest upon the proper basis, and I think that is what Colonel Farquharson had in his mind about the Volunteers. Colonel Howard Vincent was very much moved upon the subject, and perhaps not unnaturally. Another gentleman has referred to the paragraph in which the essayist states, "It is not possible that men who are begged and not ordered to attend parades and drills can have anything of the nature of discipline." Colonel Cave has said that he has ordered his men to attend on parades. The question is whether, when he ordered, they obeyed.

The CHAIRMAN: Colonel Cave stated that they did obey him.

Colonel FEATHERSTONHAUGH: But when the individual man gets an order to come to parade to-morrow morning, does he always come?

Colonel ALT: Every Volunteer that I have ever had experience of implicitly obeys every order, whenever a commanding officer thinks it necessary to issue such an order. If I issue an order to a man or to ten men to come up they come up, and if they did not they would know something about it.

Colonel FEATHERSTONHAUGH: Am I to understand that that is the rule throughout the Volunteer Service, or is it correct that the men are *asked* to come when they ought to be *ordered* to come?

Colonel ALT: Certainly not.

The CHAIRMAN: I really don't think we shall get on by asking questions in that way. Nobody could answer such a question as that, whether it is the custom to ask men to attend a parade instead of ordering them.

Colonel FEATHERSTONHAUGH: It is stated so in the essay, but I will pass on. Then we come to the remark by General Sherman about the Americans, when he said they had "good organization, good men, but no cohesion, no real discipline, no respect for authority." I should like to call attention to the fact that the American man is a very different being from the Englishman. That remark certainly was true of Americans, but I do not believe it ever will be true of Englishmen. I believe that if you were to assemble Englishmen together at a moment's notice, they would have respect for authority. Then, as to the Volunteers themselves, although I am an engineer officer, I have seen a good deal of drill in my time, and up in the north, where there are not many Regular troops, I have had occasion to inspect battalions of Volunteers and infantry Volunteers, and the impression on my mind was that they always drilled exceedingly well.

Brigade-Surgeon STAPLES: I should very much have preferred if some other officer of the Regular army had replied to the Volunteer officers before I got up, because it seems to me that we have got away a good deal from the subject of the essay, viz., the military organization best suited for the Empire. If I might be allowed to say so, I think the three officers whose essays have been published have grasped the subject very well, and even the Prize Essay is only attacked on points of detail, for after all the Volunteer discipline is only a question of detail from an

Imperial point of view. If you look at the constructive portion of Colonel Farquharson's scheme, as you are aware, it includes a long-service army for India. That is the main basis of the scheme, with an improved short-service army for this country. My chief concern, as an army surgeon, is with the first of these two propositions, but I want, first of all, to refer to what is said on page 335 of the essay, where Colonel Farquharson, in speaking of the home army, says that it was 105,000 strong in 1870, and that the men composing it were nearly all fit to go on active service, an unfavourable comparison being drawn with the force we now have for a similar purpose. I wish to join issue with him about the 105,000 in 1870, for the War Office Annual Report for 1872, which contains an abstract for 1870 ("Army Annual Return for 1872," p. 8, which shows only an average strength of 85,000 non-commissioned officers and men in 1870), does not bear out these figures. The question of course would be regulated in the army of the present day by the number of young men who are not fit to go on active service, the assumption being that the men of 1870 were all fit to go; but it appears from the War Office Return that in the army of that year, viz., 1870, there were 19,000 (calculated from the A.M.D. Report for 1870) men under 20 years of age, what you call immature boys, and they certainly were not fit to go on active service. To test the question in another way, there were 24,000 recruits raised that year, and they certainly could not have been fit to go upon foreign or active service. I deduct also 15,000 for depôts and instructional and clerical staff and casualties, so that, although we may nominally have had 85,000 (average strength of non-commissioned officers and men) as the available strength of the army at home for that year, it is reduced to 50,000 as all you had fit to go into the field, and I believe that to be a liberal estimate. Then we have also a Return showing the strength of the infantry battalions in that year (A.M.D. Report for 1870, pp. 19, 20, and 21). There were only four of them over 700 strong, and they included all the recruits as well as old soldiers and other men not fit. I merely mention that to prove my case that in 1870 we could not have possibly put into the field from the home army more than 50,000. You can do exactly the same with the present army, but, instead of having only 85,000, you have 100,000 (A.A. Return for 1891, p. 8). As before, I deduct men under 20 years of age, viz., 31,000, speaking in round numbers, and also 15,000 for depôts and instructional staff, and we then get the same number practically as in the previous case. I may put it shortly in this way: you have got in the present home army exactly the same number of men that you had in the old home army in 1870 fit to go on active service by reason of the *numerical* increase of the army. Take, again, the army abroad. In 1870 there were only 85,000 men abroad (A.A. Return for 1872, p. 8), whereas now you have 100,000 (A.A. Return for 1891, p. 8), so that you are 15,000 to the good upon that calculation. Taking the two armies under the colours, you are nearly 20,000 to the good under the present system by reason of the increase of the army, and you have also 80,000 in the 1st Class Army Reserves, bringing the whole up to 100,000 men extra, and all, or nearly all, of them fit to go on service. Now, Colonel Farquharson says that that is a very poor thing to have done for two millions of money or thereabouts, but generally I think it will be regarded as a most extraordinary thing, and a great administrative success. It may be said, perhaps, that it is a question of statistics, but I thought I would go into it nevertheless to show that the premises of this paper are not correct about the strength of the army now and in 1870, and if that is so the same rule will be applicable to the conclusions based upon them with regard to this part of the subject. I will come now to the constructive scheme of Colonel Farquharson as regards the long-service army for India, and I say at once that he says himself very fairly that the objections to it are mainly upon medical grounds and upon grounds of discipline. The question of discipline does not concern me, inasmuch as I am looking principally to the medical side of the case. One of the most remarkable things in the administration of our army of late years is the decline of the death rate in India. When I was a young man in the Service the death rate in India was something frightful, 40, and sometimes more, per 1,000 of the strength, whereas it is now only a decimal over 14 per 1,000 (A.M.D. Report for 1891, p. 122), the result being that, under our present system, we hold India at a loss of life not a half what

it was when you had the long-service army, but very little more than half what it was in the Company's time before the Mutiny, when there were only about 30,000 troops in India. That is greatly due to the fact that the old soldier class, amongst whom the incidence of mortality was greatest, has been withdrawn from the army; the service of the men in India is much reduced, and, that being so, any reversion to the old system will meet with decided opposition from military surgeons. Colonel Farquharson has very ably grasped the subject himself, and now he proposes to meet the case in this way. He takes 18 years as the term of service, and proposes to give a man every fifth year in England. That is based apparently upon motives of philanthropy which we all admire, viz., to make the condition of the soldier equal to that of the officer with regard to leave home and invaliding, but I think that would be almost an impossibility. The invaliding rate of officers is very high, and, if the same rate were carried out with the men, you would have to enormously increase the army. Would it be feasible to do that? If a man is to come home every fifth year, what is to be done with him? Colonel Farquharson says that he might have a certain time on furlough with his friends and a certain time at the depôts, or he might spend all his time at the depôt. Suppose the case of a man who was six months with his friends. I have a fair acquaintance with the class of men entering our army, and who still furnish by far the greater number of recruits, viz., the men from the agricultural districts; and I would ask any officer here who has similar knowledge, are the friends of these men in a position to put them up for six months when they come home? I, for one, do not think they are. Or would the soldier like to be with his friends at all? I doubt it very much, or that it would be good for him either, from a military point of view. Then suppose he lodges in the town; would he be able to pay for that and for his board out of the allowance the Indian Government is supposed to give him? I do not think he would. Then, supposing he were drafted to a depôt, do you think he would come home for that purpose willingly? Bearing in mind that he will be a servant of the Government of India, I am certainly not free from doubts on the subject, and I may add a personal opinion that any such scheme would be calculated to lead greatly to desertion. Now I want to go on to another point. Colonel Farquharson does not say what pension he would give these men after 18 years in the Indian army; but I am happy to allow Colonel Farquharson to escape from our minds for a moment, and take a book written about the "Defence of the Empire" by Sir Charles Dilke and Mr. Wilkinson, in which a scheme similar to this is discussed. In a place like this, where all are professional men, it is not necessary, perhaps, to pay much attention to amateurs, but these amateurs are well known to be the mouthpiece of other people, and they propose after 18 years of Indian army life, which admittedly unfits a man to compete in the labour market, that these men should get 1*s.* a day. Now, anyone who knows what 1*s.* a day means will, I think, acknowledge that no scheme of this kind, unless you are prepared to pay very much more for it, will ever succeed as regards a long-service army for India, and the reason apparently is this. A shilling a day was struck—I speak subject to correction—in the days of George III, and yet it is not proposed in the year 1893, when the price of provisions and the rate of wages have increased enormously in other trades, to raise this very old rate of the soldier's pension. These points seem to me to militate most strongly against the proposed reversion to a long-service army for India, which is one of the main points in Colonel Farquharson's constructive scheme for the best military organization of the Empire. But having offered these criticisms, I desire, before concluding, to compliment Colonel Farquharson on the literary power of his essay, and to add that his studies on the naval and military constitution of the Mediterranean Republics appear to me to be a lesson in historical research that is interesting for us all.

The CHAIRMAN (General Erskine): Gentlemen, I am very sorry to make any interruption in the interesting discussion which we have had in this theatre this afternoon, but it is absolutely necessary that I should vacate my place as chairman. And I do so with less regret because I shall be succeeded by a person in whom I have every confidence, and who, I am sure, will preside here more efficiently than I have done. As Colonel Farquharson is present and intends to address the meeting before the discussion closes, it would be manifestly wrong that I should attempt to

sum up before he has been heard. I shall not therefore attempt to do so, but I cannot bring myself to leave this theatre without saying a few words to my old friends of the Volunteer Force. I happen to know a little about that force, as I was employed with it from the very beginning, and for some years I had charge of it entirely myself, and my testimony with regard to it is altogether in its favour. I am quite sure that if the circumstances of the country required that the Volunteers should be called out, they would fulfil all that is expected of them. Altogether, I think that my friends of the Volunteers, if they will allow me to call them so, may really calm their feelings about what has been said in the essay, as they consider, to their detriment, for I am sure that the generality of the officers of the army, both high and low, have the highest opinion of the value of their services, and are proud to associate themselves with the Volunteers in carrying on the defence of the country. I very much regret not being able to remain until the discussion is brought to a close, when I should have been in a position to sum up; but my friend Colonel Lonsdale Hale, who will take my place, will, I am sure, do it most efficiently.

[Colonel Lonsdale Hale then took the Chair.]

Lieut.-Colonel R. HENNELL, D.S.O.: As an officer who served 28 years in the Regular Service, and has commanded a Volunteer regiment for three years, I can bear my testimony to the discipline of the Force as it has come under my observation. Certainly I had not the feeling which has evidently been raised in reading over this most able essay. I thought it was most admirable, and although those few lines about the discipline of the Volunteer Force struck me as out of place, they seemed to me to be put in altogether as generalities. Everybody must know that men must be brought together and kept together, and drilled day by day and hour by hour if they are to attain to a high state of discipline; and one would never think of casting any aspersion on the Volunteer Force, composed as it is of men who leave the work of their offices, who leave their professional business or trade, having worked at them up to five or six o'clock in the evening, who then do not go to their own homes, to sit down in their family circles, but, having brought up their uniforms to their offices or workshops, go straight down to the drill ground, sometimes twice a week, certainly once a week. No one could expect that at the final moment of mobilization their discipline could be the same as that of the Regular army. A question just now arose about ordering the Volunteers to attend parade, and I think, perhaps, the officer who spoke hardly sufficiently explained the matter. Ordering Volunteers, as I gather from three years' experience, is simply this:—A Volunteer has to do so many drills, whether you take a recruit or a trained Volunteer. Very well, the Commanding Officer orders a parade; every man cannot attend that parade—business, illness, other engagements may interfere with his doing so. The order is to the regiment, not to the individual. Actual discipline comes into force when the Volunteer is brought into contact with the non-commissioned officer or with his officer on the parade ground. If that is so, then I maintain that there are very few instances, at least that have come before me, of anything like a want of discipline. Say, you issue your order that the battalion will parade on such-and-such a day at such-and-such an hour; you have a battalion of 800, 900, or 1,000 strong. Well, 300 men turn up. Perhaps it is a pouring wet night. There can be no question of discipline there. The men are at long distances from the parade ground; they cannot come. That is not a question of discipline; that is not a disobedience of orders. The order has been issued, and as many men come as can come. I have only this to add, that I have been fairly astonished to see the difference that three or four days make after the men come into camp. You get your men down on the first day. They have not been together before during the whole year. Within a few hours a marvellous change comes over every one of them, and on the second and third day they have thoroughly settled down into their work. It seems to me to be altogether wrong to say that this force would not have that discipline which is necessary for the defence of our Empire under the terrific stress of an invasion, when every man knows that he has to defend hearth and home. I say that in a week after they were mobilized you would not know those men at all. There have been isolated instances of breaches of discipline

in the grandest armies and navies the world has ever known, but no sane man would condemn or decry those forces for the misbehaviour of individuals or minor bodies. We judge a force by the general conduct of the whole, and I say the Volunteers of England, as a whole, have set an example of discipline such as any Englishman may well be proud of.

Colonel Lonsdale Hale (acting as Chairman in the absence of General Erskine): This discussion has been somewhat of an abortive character; abortive, inasmuch as the Council proposed it as a discussion on the whole Prize Essay, whereas, practically, it has been on only three pages out of 30, no doubt on a very important point, but not on the most important point in the question of imperial defence. The essay, as a whole, has fallen flat, and I venture to try to show why this is the case. The essayist will not care one atom what I say about it, because I am one of those individuals who honestly admit that they want to pay less and receive more money; and in the opening pages he anathematizes those of us who hold these aspirations, and he calls us unpatriotic. Moreover, if I feel a little bit of inertia about the question of imperial defence generally, it is not from any want of patriotism; it is because all the authorities, including Colonel Farquharson, who have studied the subject have each their own nostrum, and therefore, until these experts have arrived at some agreement among themselves, they cannot expect the rank-and-file like myself to care to give more money to carry out any particular scheme. I shall hardly like to speak on the burning question of the Volunteers, because a Volunteer officer has told us to-day that nobody except a man who has been in command of a regiment of Volunteers can pronounce any opinion on the force. Nevertheless, I may venture to make a remark or two. I will first explain why I think the essay has fallen a little bit flat. The reason is that it is so empirical. Colonel Farquharson gives us three armies, but he does not take the trouble either to argue in favour of them to any extent, or to meet the objections which may be raised to them. He leaves it entirely to us to find out those advantages and to meet those objections. That is particularly the case with regard to his Indian army, of which he says that the objections to a long-service Indian army are either medical or disciplinary; but he does not tell us in detail what the difficulties are; he does not tell us how they are to be met, but with a most charming sweep of the pen he brushes them aside with the words, "Both objections would have to be removed by special measures." There is another objection to the treatment of the subject in this essay: it arranges matters not for the British Empire, but for the British Empire minus India. The essayist says that India is not to interfere with the scheme at all. He does not care twopence about the cost to India; India is to pay her own shot. He says, "What is essential is that India should no longer be the main obstacle to the development of the armed strength of Great Britain for land warfare." But surely Indian land is an integral part of the land of the Empire, and therefore I do not see how any scheme that does not include the defence of the land of India can be said to give us an organization adapted for imperial needs. My idea is, the two are so mixed up that you cannot separate them, but the essayist puts India altogether out of the question. I will give him his Colonial army with the greatest pleasure. It is to have enough foreign service to render life a little pleasant; it is not to have too much foreign service, so men in it will not be exiles; it will be the first used in "little wars." Therefore all the stars and garters, ribbons, promotions, and glory—every single thing—all will go to these 50,000 men of the Colonial army; service in it will "pay" well. Then you have the "training army." I have never read or heard of any army like this—a training army from which he is to get the 100,000 men for operations in Europe and for the defence of the Empire in regular warfare. This army, when mobilized, will consist of reserve men only, so far as I can see, men—cavalry, artillery, infantry, and sappers—who have only had two years, not of German but of English military discipline, not of German training but of English training. What is that army likely to be worth, and what are the officers of that army likely to be worth? These officers will pass their lives in training their men, with a huge European war their only prospect of service. You will have the dregs of the officers in the training army and the pick of the officers in the Colonial army, and as to how these 100,000 Reserve men are to be organized, what

cadres are to be formed, whether these troops are to go into brigades, divisions, or army corps, the essayist has left out of consideration. This essay is then purely empirical, and empirical essays are not popular, nor do they command acceptance. Now let me say a few words with regard to the Volunteers. On one point I agree with the essayist. I detest the Volunteer movement, for I think the existence of Volunteers deadens that sentiment which I believe is the root of the sound defence of a country, namely, that every able-bodied citizen is bound to contribute, in his own person if required, to that defence; the Volunteer movement deadens that sentiment, and therefore, as a movement, I regard it as hurtful in the highest degree, and dislike it accordingly. But beyond that I do not go. I hope that Colonel Farquharson will take advantage of being here, not to explain—because really the sentence is inexplicable—but to withdraw that remarkable sentence of his in which he indicates that he considers the only value of the Volunteer Force is to promote the physical training of the youth of Great Britain. How a gentleman with the ability to write these pages can see none of the great advantages in the Volunteer Force beyond that of training the physical youth of Great Britain is to me ununderstandable. But where I think the essayist fell into a mistake, is in treating the Volunteers as a homogeneous body. He paints them all with the same brush, and my notion of the Volunteer force is that it is heterogeneous in every single respect, whether in the efficiency of battalions as battalions, the efficiency of officers, or the efficiency of battalions in themselves. The best and the worst regular battalions at Aldershot are comparatively on a par compared with the best and worst battalions of Volunteers. And I have reason to believe that that difference exists in the battalions. An officer said to me the other day, "My battalion consists of eight companies, five of them in town are excellent, but we cannot get at the other three because they are all in the villages." It is in the same way with regard to officers, and I speak with some experience in that respect. I have great opportunities of judging of the military knowledge, the military ideas of the officers of the Volunteer force not only in London, but in Scotland, and different parts of the kingdom, and the difference between these gentlemen is simply astonishing. There are officers of the Volunteer force whose knowledge of their profession, whose knowledge of military work is far above that of the average Regular officer of their own rank; but, on the other hand, I have been thrown sometimes into connection with officers in high position in the Volunteers whom I should not like to trust with the command of a corporal's guard. I have always maintained that it is a most heterogeneous force, but that from it might be got 40,000 or 50,000 men who, in a little time, could be turned into the finest infantry in Europe. One word with regard to these inspections. When the inspecting officers use to the Volunteer words of flattery, which Colonel Farquharson seems to think injure the discipline of the Regular force, why, Tommy Atkins laughs at them! We all laugh! We say to ourselves, "If these Volunteers are such fine fellows as soldiers, what is the good of any Regular force at all? Let us all be Volunteers." We do not believe in fulsome praises; the flattery does not hurt us, but it does hurt the Volunteers. It does hurt a good Volunteer battalion, well commanded, well officered and disciplined, to find that same General go the next day to an inferior battalion with inferior officers and put on the butter. What possible encouragement can it be to a good Volunteer battalion to maintain its efficiency? What incentive can there be to an inefficient Volunteer battalion to strive to do better if Generals and commanding officers are all to come and say, "You are thundering fine fellows! You are the best fellows we ever saw!" It does the Volunteers harm, not us Regulars. I will now ask Colonel Farquharson if he would like to offer any remarks in reply. It is a case of Daniel in the den of lions: he has heard a great amount of growling, and I trust that, like the prophet of old, he will issue equally unhurt from the theatre this evening.

Lieut.-Colonel FARQUHARSON, C.B.: I should like to refer first, sir, to the remarks which you have just made, and to rather protest against the opinion that the dregs of the officers would be found in the Training Army. The officers of the Training Army would be available for active service. They would, in fact, be in the same position as the officers of Her Majesty's Guards, or the officers of the German army. As to the Colonial Army, no doubt they would come in for a good

many of the honours in small wars out of India, but, on the other hand, they would have the Colonial peace garrison service to do, which is not generally considered very popular. Then, about the Indian Army, I think that it is only necessary to say that two out of the three referees on the Prize Essay are, I suppose, two of the most distinguished Indian officers who are in the Service, and if they agree to what has been said in this essay I think we may take it as strong evidence that it would be practicable to separate the Indian Army from the rest of the Service. This will also be a reply to Brigade-Surgeon Staples. The next point is about the Militia. I need only say about them that I do not think there is anything in the essay which is not friendly; in fact, what I said about the Militia has been said in quite as decided language by a very distinguished officer of the Militia, whose retirement I am sorry to see in to-day's "Gazette," Colonel Sir George Walker of the Scottish Borderers. He said, in a lecture in this Institution in 1887 or 1888, with reference to the number of officers for the Militia, that they were too few, that there was only one officer to 40 men, and that for "partially trained and disciplined troops" he did not think that was sufficient. I do not think I have gone any further than that. Then Major Maxwell, in giving evidence before the Militia Committee of 1876, he having been many years in the Regular Service and many years a Militia adjutant, laid down exactly what I have said, that it would take the Militia six months' embodiment to be equal to the Line. There was another officer, I think Major Hillman, who had also been 20 years an adjutant of the Militia and 20 years in the Regular Service, who said that the best thing that could be done with the Militia was to bring out one-third of them every year, so that every Militia regiment should be out the whole of every third year, and if that were done they would be equal to the Line. I do not think I have gone nearly so far as that, and need only say that I think the Militia is an excellent force, and not only that, but at present we could not get on without them. Then, so far as the Volunteers go, I am sorry to find the first two officers who spoke did not quite comply with the Chairman's request. We could hardly call their addresses very dispassionate. They used the word "untrue" a good deal. I shall not take up any of the remarks except on the main question, namely, that of discipline. I should very much prefer not to read out what I am going to read now, but those officers seemed to say that there was no evidence whatever of any want of discipline in the Volunteers. There is a paragraph from the "Times" of the 6th August, 1888, and I will quote it without mentioning names or places. It says a serious incident had occurred on one occasion when various Volunteer regiments were drawn up for inspection. "The rain poured incessantly for two hours, and the patience of the men becoming exhausted they raised shouts of scorn at the inspecting officer, telling him to take off his mackintosh and overcoat, and stand the weather on the same conditions as they did." Ultimately their colonel succeeded in pacifying them. That is one instance. Next we have an instance last year of an Eastern Counties regiment, where we are told that the death having occurred of the drummer of the corps, who was a man greatly respected by his comrades, a number of the men were anxious that he should have a funeral attended by the whole of the corps, and a request was made to the colonel to this effect. But a battalion drill had been arranged for the same day as the funeral, and the Colonel intimated that he could not alter his arrangements. The funeral took place, and was attended by the band and fifty or sixty members of the corps. Ultimately the band did not go to the battalion parade at all. There was a noisy crowd, the ranks of the men were broken, the Colonel was hooted and hissed, and the drill was brought to an abrupt conclusion. Next, I said in the essay that there could be no real discipline in a Service in which men were begged to attend parades and not ordered. I have here an appeal from an officer commanding a Volunteer regiment, who writes within the last two months under the head of "A Request." "Absentees: there are several—far too many—Volunteers who have not attended any drills yet this year. The commanding officer regrets this, and trusts that all those will arrange to commence their drills at once." Then he goes on, "The sergeants of sections are particularly requested to see these Volunteers personally, and get them to attend their drills, and to kindly take more interest in the battalion and their duties." I say it is quite impossible there can be discipline when men are addressed in terms like those.

Then there is another case, a quite recent case, of an instructor, a sergeant-major, belonging to the permanent staff, I suppose, whose time was up, and the officer commanding the brigade or battalion, or whatever it was, did not see why this man should remain, and he therefore had him sent away, or allowed him to go away. Two of the companies of the corps objected to this; and they sent in their resignations. I do not call that discipline. But we are met not merely with cases of that kind; I can fall back, as in the case of the Militia, upon the opinions of Volunteer officers themselves. Here is an opinion which came out about a year ago in a Service magazine: "There is one further failure in the present system which ought not to be passed by, difficult and delicate as it is to handle. There can be no doubt that in peace time, when Volunteers are congregated together, and are not placed under military law, difficulties have arisen in some corps as to the maintenance of proper discipline. The traditions, the social positions, the *esprit de corps*, and other essential characteristics of different Volunteer regiments differ so widely, that general statements on this subject are bound to be untrustworthy. There are, fortunately, very many battalions in which any intentional breach of discipline would be resented by the perpetrator's comrades as a direct insult to themselves." That is perfectly true. I have never said a single word against the general good conduct of Volunteers; in fact, it is specially stated in the essay with regard to their conduct and intelligence, that there is not the slightest reason why they should not, with proper discipline and training, be a valuable force. He goes on to say, "There are corps in which many of the privates belong to the same class as those who compose Militia battalions. In these cases the existing law is sometimes insufficient for the maintenance of discipline and the proper respect for officers. In making this statement I have a definite set of instances in my mind although, for obvious reasons, I cannot particularize further." I do not think I have gone much beyond that in the essay. Then there is another Volunteer officer of very high standing, one of the brigadiers of the force itself, who says, in discussing different questions about Volunteers, principally, I think, about brigade commanders: "The chief defects of Volunteers are want of discipline and want of mobility." I think, therefore, I have justified the statements I made, both by special instances and by other opinions than my own. With regard to the other parts of the essay, I am only sorry that they have been so slightly touched upon. I do not think it is necessary for me to say much more now as to the general principles of the essay, because it seems to me that mere discussion is not the way in which these things can be settled. I think they require a great deal more consideration than can possibly be bestowed upon them in a discussion in this theatre; and I need only say here that I should be glad if the general principles stated in the essay could get to a more definite consideration and conclusion. But one thing, I think, has certainly been forgotten during this discussion, and that is that the subject that was laid down for the essay was: "The System of Military Organization *best* adapted for Imperial Defence." The argument I have to meet to-day seems to be that men are fully qualified as soldiers by thirty drills of an hour each in each of the first two years, which is practically one week's drill in each of the first two years; and by two days' drill—that is to say ten or twelve drills of one hour each—in every succeeding year; that those men are to be considered perfectly fit to meet in the open field German or French soldiers, whose training is not considered satisfactory until they have been two or three continuous years under strict drill and discipline in barracks, and who have six months' training in close squad and company drill before being allowed to join the battalion at all. And it seems to be argued that these men are no better soldiers, no more fit for open field fighting, than men who have only about one week's training in drill and discipline in each of the first two years, and about ten or twelve hours' training in every year afterwards. I cannot conceive that the country generally can put any faith in such opinions as those.[1]

[1] The line adopted in my remarks at the meeting may appear too uncompromising. But so also were the remarks of the Volunteer officers. It became necessary to quote typical instances of indiscipline. Those instances may be few

The CHAIRMAN: Colonel Farquharson has stuck to his guns, and I suppose we all do. I have nothing more to do except to dissolve the meeting.

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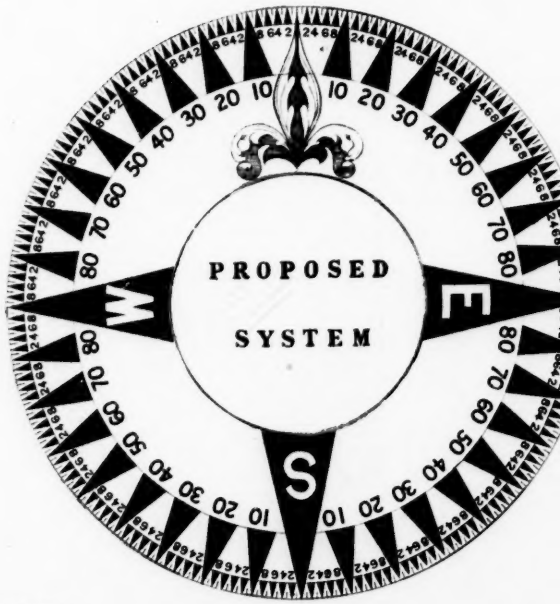
or many without affecting the fact that they are sure to arise under an organization such as that of the Volunteers. For it is a military axiom that the discipline of large bodies of men cannot be maintained without certain conditions, such as judicious treatment, the power of punishment, camp or barrack life under military law, and a certain amount of rigid mechanical drill. It is owing to this principle that Regulars must be superior to Militia, and Militia must be superior to Volunteers. It is useless to say that mere dismissal from a corps is a sufficient punishment for military insubordination. But although Volunteers cannot form part of the best military organization, it is nowhere said in the essay that they are useless. It is not disputed that the corps which form the Volunteer force, whether of artillery, engineers, or infantry, in such places as London, Edinburgh, Leith, Glasgow, or Liverpool, are a distinct addition to the military strength of the country. What is disputed is the claim which many Volunteers have in recent years put forward, that they are the only field troops available for home defence against an invasion in force; that their training and discipline are sufficient for this duty; and that they should, therefore, be provided with the brigade organization, the transport, and the artillery required by a mobile field force. It is controverted by all military history that such a force could successfully meet regular troops in the open field; while it is confirmed by all military history that, for local defence behind defensive works, partially trained and disciplined troops like the Volunteers have often been victorious against the efforts of the best regular troops. The latter *rôle*, therefore, is that best suited for the English Volunteers, and to that *rôle* they should confine their ambition. It is surprising that Colonel Hale does not see that in admitting that the Volunteers are not a homogeneous force he gives away their case. A system which must from its latitude of training and discipline necessarily produce a heterogeneous force must for field fighting be essentially a wrong military system. And the ablest officers of Volunteers—for no one questions that there are many able officers of Volunteers who in zeal and knowledge equal or excel many Regular officers—are perfectly well aware that the system under which they are condemned to work is an unsatisfactory system, not merely for the defence of the Empire as a whole, but for the defence of England itself against invasion; and that it is a system which cannot possibly be considered capable of producing a force which would form part of the *best* military organization for Imperial needs.—J. F.



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Friday, July 7, 1893.

CAPTAIN H.S.H. PRINCE LOUIS OF BATTENBERG, G.C.B., in the Chair.

THE ADVISABILITY OF ADOPTING A MARINER'S COMPASS CARD MARKED IN DEGREES ONLY, IN PLACE OF THE ONE NOW IN USE.

By Lieutenant J. F. STUART, R.N.[1]

IN advocating the introduction of a compass card marked in degrees only, as in the diagram before you, I am well aware that it is no new thing that I wish to bring forward, but that many navigators, though fully recognising the simplicity that would ultimately accrue to navigation by such a change, have been unwilling to bring before the public its advisability. They see, perhaps more clearly than I, the difficulty of inducing the seafaring public, proverbially conservative, to admit the necessity for it; and, even if this could be done, they probably consider that the labour and expense entailed by the change, and the temporary confusion that might arise during its process, would outbalance the good to be derived from it.

One need not be a very deep student of human nature to be alive to the difficulty of persuading the average run of mankind to admit that those institutions among which they have been brought up, and the method of conducting business to which they are accustomed, are not the very best.

Probably, without their being aware of it, one of the chief reasons which render people so conservative lies in the fact that a change almost always necessitates an effort; also, our old customs and institutions acquire from age a reverence which makes us unwilling to subject their practical utility and continuance to unsparing examination. The history of the division of the compass card into points is natural and simple.

Our bold Norse ancestors trusted themselves to the open sea with no compass at all.

The primitive compass used by their immediate successors was but a north-pointing needle. Then came the introduction of a compass card, marked at first with only the four cardinal points. As time went on, and the compass became a more trusted instrument, by a natural process of successive bisections, came the intercardinal and, finally, the complete 32 points.

By the time these 32 points had been arrived at, their nomenclature

[1] In the unavoidable absence of Lieutenant Stuart, his paper was read by the Secretary.

was already so complicated as to prevent special names being given to the half and quarter points into which, by the same process of evolution, the points were divided, and the result was a very prettily-marked card, with very clumsy and lengthy names attached to three-fourths of all the markings; names difficult to learn and difficult to retain; clumsy, because in naming such a point as north-east by north $\frac{3}{4}$ north it is necessary to make use of five distinct words and two figures, and mentally to travel to and fro between north and east.

It is a vexed question as to whether this point should not be more properly named north-north-east $\frac{1}{4}$ east. This is an improvement in brevity, but it cannot compare with such a designation as N.25E.

The difficulty of acquiring the naming of the points and quarter points, and the pride of those who had mastered what is considered to be a first and important step to a knowledge of seamanship, and which is dignified with the special appellative of "boxing the compass," will probably be sufficiently fresh in the memory of most seamen. I think navigators will agree with me that in a large ship's company, where turns at the wheel come few and far between, a bare quarter of the seamen (notwithstanding the time and trouble expended on their instruction) could be trusted to name confidently to the nearest quarter of a point the course on which a ship might be heading.

Imagine for a moment that the reading of the clock, barometer, thermometer, and other instruments in daily use could only be acquired with as much application as that of the compass, and consider what obstacles would be thus placed in the way of their comprehension. Surely, scientific accuracy must be founded on a nomenclature simple and accurate!

Let us now look at the finished article, and consider if it meets the requirement of its primary object, namely, to be an instrument by which a ship can be steered with precision in the open sea. Suppose I am crossing the Atlantic in a 20-knot ship: my position is fixed at noon, my proper course lies midway between two adjacent quarters of points. I tell the helmsman to steer on one or other of these quarters. On the following noon, as the result of this error of an eighth of a point in my course, I shall find myself nearly 12 miles from the position I wished to steer for.

Do you consider this 12 miles sufficiently near for practical navigation?

Suppose, to meet the difficulty, that I again split my quarters to points, I find myself using such a mouthful as north-west by west three-quarters west westerly, and the quartermaster has no definite mark on the card to steer by, and the redundancy of expression has effaced any definite conception from his mind.

I ask, Does this compass card meet the requirements of the present day?

Let us now look at the calculation that has to be gone through in order to give the quartermaster the compass course.

I take the magnetic course from the chart, and wish to apply the correction for deviation, but, to the surprise of the uninitiated, it is

customary to use as the unit of error of the compass, not the point or quarter point in which it is graduated, but the degree; so that the magnetic course obtained from the chart must be turned into degrees, and the result turned back into the nearest quarter or eighth of a point. The alternative is to turn variation and deviation into unwieldy fractions to the nearest sixteenth of a point, if the result is not to be as much as an eighth in error.

This calculation takes an appreciable time, error is risked in the translation of degrees and points, probably also, some table for converting degrees into points has to be referred to, as few navigators keep in their heads the exact number of degrees corresponding to each quarter or eighth of a point.

If the answer to my previous question is in the affirmative, and we are told that the system of marking compasses in points is sufficiently accurate for purposes of modern navigation, should we not confine ourselves in all matters concerning the compass to points alone, and should we not use deviation and variation in terms of points or quarter points, and in no other terms; or can there be any good reason brought forward for using the two systems of points and degrees entangled as at present? Having pointed out some of the defects of the system of points, let us now examine the advantages of the system which it is proposed to substitute for it.

In matters connected with the science of navigation, the English notation and system of division of angles and arcs are almost universally accepted. To that system only I shall therefore allude.

Our unit of angular measurement is the right angle. This is divided into 90 equal parts called degrees.

The quadrant or quarter of a circle is likewise divided into 90°. Any possible bearing can, therefore, be expressed in the simplest and most intelligible manner by saying that it is so many degrees east or west of the north or south point of the compass.

We bring our compasses thus into conformity with all the other measurements of daily life and science. We remove all ambiguity. Azimuths, amplitudes, errors of compass, are all worked out, expressed, and adjusted by figures bearing the same meaning.

The necessary calculations in applying the variation and deviation would be shortened and the risk of making errors much diminished. Bearings could be more easily written down or more easily remembered, and so the fixing of a ship's position by bearings would be facilitated.

A child could read such a compass and a child could remember its markings. Our next step is to consider what things would be affected by the change.

These would chiefly be rough bearings, rough alterations of course, rough direction of the wind, sailing directions, charts, signal books, pilots' courses, and the compass card.

The look-out man in sighting an object might still, if he chose, denote its bearing from the bow, beam, or quarter, in points, the unassisted eye being unable to distinguish the difference of bearing to a few degrees. In rough alterations of course, for clearing ships and

newly discovered dangers, the officer of the watch would give the order to starboard or port 10 or 20 degrees, instead of one or two points, &c. The direction of the wind would also be spoken of in degrees.

The other objections to the alteration are not so easily disposed of.

In the matter of charts, the Hydrographer of the Navy has greatly facilitated the carrying out of the change by introducing into the charts a circle of degrees around the compasses, and in the course of time all Admiralty charts will be so issued. Until such time, the tissue paper compass diagrams printed in degrees, as sold by Messrs. Hughes & Son, of Fenchurch Street, might be pasted over the existing compasses on each chart, as it came into use.

In the signal book where points are referred to, the corresponding degree would have to be substituted, and the existing method of giving two flags to each quarter of a point could readily be extended to give two flags to each division of 2°.

The bearings given in charts and sailing directions would have to be altered into degrees, a matter of no light labour and expense.

Pilots would have to relearn all the many courses they are obliged to keep on the tips of their tongues.

The remaining alteration that would have to be made is that compass cards should be plainly marked in degrees in such a manner that the helmsman, in even a feeble light, could readily keep the ship's head on any course to the nearest degree. The compass card of which the diagram is before you, I think, meets this requirement.

I cannot leave the subject without alluding to the possibility of introducing compass cards carrying degrees right round the compass from 0° to 360°. This would have the effect of getting rid of the somewhat intricate rules for applying deviation and variation that are now necessary.

These rules require so much thought in application that navigators will, I think, agree with me that few people not constantly in the habit of converting magnetic and compass courses and bearings will do so correctly and without hesitation on the spur of the moment, and also that their wrong application is not an unfrequent source of error.

This latter proposition would, perhaps, be going too far ahead for the present, but the change under discussion would be a great step towards it.

And now, having had the privilege of reviewing the pros and cons of the case before this Institution, what answer is to be given to the question as to whether the proposed change should be made. Is the change desirable? If it is desirable, is it feasible? Are the difficulties in the way so great as to make it imprudent to tackle them; or is it seen that this great stride towards the simplification of navigation must come some day, that things are ripe for it now, and that England, the greatest of maritime nations, should lead?

The CHAIRMAN: Before calling upon any gentlemen present to offer remarks on the paper, I should like, with your permission, for the Secretary to read a very important short paper addressed to me by the Hydrographer of the Navy, who

is unfortunately prevented from being present this afternoon, containing his remarks on the subject. Also some remarks by the Superintendent of Compasses at the Admiralty, Captain Creak; and, further, by the Captain Superintendent of the "Worcester" training ship, which I think will all be found valuable contributions to the discussion.

Captain W. J. L. WHARTON, R.N., F.R.S. (Hydrographer to the Admiralty):[1] I gather that Lieutenant Stuart wishes to abolish points altogether from the compass card. I have not seen his card, so that I am unable to judge of the advantage in point of clearness over Sir W. Thomson's card, but I am myself very well satisfied that the latter is for all practical purposes as clear, as regards the degrees into which the rim is divided, as can be desired, nor can I see how the omission of the points on an inner ring can make the degrees on the edge any plainer. The abolition of points on the compass card would entail the gradual extinction of the use of points altogether. But are we asked to give up talking of a N.E. wind and call it a N.45°E. wind? Such minuteness is out of place. I think Lieutenant Stuart has forgotten that both points and degrees have their own place in our professional language. Modern improvements, both in size and length of ships and in the efficiency of compasses, have made it possible and desirable to attempt to steer closer than to a quarter point, but many small vessels can in the oceans do nothing of the sort, and it is an attempt to do the impossible if tried in them. The navy is made up of all sorts and sizes of vessels, and we must provide for all, and not only that, but for all circumstances in which a bearing is involved. There are many in which language aiming at greater accuracy than a point is observed. I am introducing degrees into the compasses or charts in order to avoid the mistakes which inexperienced navigators must unavoidably make in translating the bearings they obtain with the azimuth compass into points and quarters before they lay them down on the chart, but I hope that no one will therefore assume that all charts are so accurate as to justify confidence to a degree. There are many charts, founded on old and imperfect surveys, in which bearing lines for clearing danger cannot be assumed to be more exact than to the quarter point. There is also the change of variation to be considered. In many parts of the world this is so rapid that a clearing mark given to degrees would soon be a degree in error. The quarter point to which they are given allows more to veer and haul upon, and more time before the chart and sailing directions must be altered. The difficulty of keeping the charts of the world correct in this particular is probably very little appreciated. Of course it could be obviated by adopting true bearings, but the universal consensus of experienced navigating officers, especially of those versed in fleets, is in favour of retaining magnetic bearings, which, now that compasses are correct to a degree or two, are more convenient than ever. If it could be abandoned without inconvenience to our fleet I should be the first to welcome the change and carry it out, as it would lighten the work of the Hydrographic Office immensely. To conclude, we must have points for many purposes, and so long as we have a compass card which gives us degrees plainly for accurate purposes when applicable, the points not only do no harm, but keep continually before us the connection between points and degrees. There is nothing whatever to prevent anyone who likes using degrees, either for directing or logging a course or bearings observed. So far as Lieutenant Stuart's remarks seem to assume that this is not so, I think he is beating the air.

Captain ETTRICK W. CREAK, R.N. (Superintendent of Compasses at the Admiralty):[2] The two principal points of the paper, as I take them to be, are (1) the advisability of adopting a card marked only to degrees; (2) to abolish the use of the existing points now engraved on the compass cards. Unfortunately I have not seen the compass card proposed for adoption by Lieutenant Stuart, so am therefore unable to offer any opinion as to its value. I think, however, that if the two

[1] In the unavoidable absence of Captain Wharton, these remarks were read by the Secretary.

[2] In the unavoidable absence of Captain Creak, these remarks were read by the Secretary.

Thomson cards which I have sent for inspection are examined, it will be found that the question of the adoption of a compass card efficiently marked to degrees is fully met, and this has been the case for several years past. I have conversed with numerous officers, both of the Royal and mercantile navies, and the general consensus of opinion is that the size and clearness of the degrees on the Thomson 10-in. card are very satisfactory. It is true that I have met some officers who advocated a larger card in order to obtain larger degrees. I think, however, that the desire for large degrees has overshadowed the consequences of making very large cards. In the first place it is important that the quadrantal deviation of the compass, which can at the standard and upper deck steering positions be once for all corrected or totally annulled, should be so corrected always. The larger the cards are made, the larger must be the quadrantal correctors, until the correction becomes almost an impossibility. For even with the present 10-in. Thomson cards there are many places between the decks of our armour-plated ships where large quadrantal deviations must be left uncorrected on account of the great size of the sphere necessary for a complete correction. How much more would this difficulty be increased with very large cards! Long experience has further shown that in the Thomson 10-in. card the best limit of size has been reached, as increase of diameter brings with it mechanical difficulties and insufficient action, which largely outweigh any small advantage gained by the increased size of the degree. I should say that the number of officers who steer their ships by points instead of degrees is very small, and they must have their own reasons for doing so when they have degrees quite ready to hand. From my own experience of some years past I may say that neither quartermasters, nor the ordinary helmsman, nor other seaman noting a compass, ever give one a direction of the ship's head in anything but degrees, and they are fully accustomed to their use. With regard to the second point, the abolition of the existing points, I would propose to utilize the degree as given on all modern compass cards to the fullest extent, but would let the existing points remain for the rougher bearings, such as direction of the wind or the bearings of objects given by the look-out man. The four cardinal points and the four principal intercardinal points are also very useful in compass correction. If I may be permitted to so far criticise this paper, I should say that in some respects it is rather behind its date of appearance. I would ask its author if he can name any 20-knot ship crossing the Atlantic which does not steer to degrees by compass, and how many there are with a compass card larger than 10 in. in diameter? I should further be glad of information as to the construction of very large cards which are as certain in their action as those of about 10 in.

Captain D. W. BARKER (Captain-Superintendent, Thames Nautical Training College):[1] I entirely agree with the tenour of Lieutenant Stuart's paper. The question of steering to quarter points has long been discontinued in the majority of merchant vessels, and in my own experience I have always seen the course set in degrees. I think it would be quite possible to retain the present points, so that any difficulty with giving rough bearings from the look-outs might not be affected. There can be no question that the compass should be marked from 0° to 360° (my own little surveying compass is so marked); all matters concerning the compass error would then be easily dealt with, and many other mistakes which happen in setting courses avoided. I am quite sure that Lieutenant Stuart's paper will considerably help in this very needful reform in the marking of compasses.

Captain MAYES, R.N.: The object of this paper is to advocate the abolition of the point division of the compass card. I must premise my remarks by reading, with the Chairman's permission, a paragraph from "Raper's Navigation" on this subject. He says: "Dividing the circumference of the card, by successive halving, into points, half-points, and quarter-points, was well adapted to the time, not very distant, when many helmsmen were unable to read. The quarter-point was also considered the smallest division a man sometimes under the blinding influences of wind, rain, and spray could well distinguish. Now, however, the cards of steering

[1] In the unavoidable absence of Captain Barker, these remarks were read by the Secretary.

compasses are frequently divided to degrees, in addition and external to the point divisions. In cards of 9 or 10 in. in diameter, the degrees are sufficiently large to be distinguished by men of ordinary sight. The degrees are always marked from north or south, towards the east or west; the courses, therefore, are read from left to right, and *vice versâ*, in alternate quadrants. This is apt to cause mistakes in steering. For this reason, and for precision and brevity in speaking, writing, and signalling, there is much to be said in favour of marking the card from zero to 360°, round by the right. Small compasses for shore work are thus marked generally." The lack of education among seamen can no longer be given as a reason for retaining the point division of the compass card, and, from their gunnery instruction, men of the Royal Navy at least are quite familiar with expressing angles by degrees. Thus there are three distinct methods of marking compass cards: the point divisions, the degree divisions reckoning from 0° to 90° in each quadrant, and the degree divisions reckoned from 0° to 360° round the circumference by the right. The point division alone is inadequate for the purposes of navigation, and we are now working with the point division combined with the degree division in each quadrant. There is some danger in working on these two systems, as was shown in the inquiry into the sad loss of the "Roumania" on the coast of Portugal. Lieutenant Rooke, of the Bombay Cavalry, was one of the two Europeans saved from that wreck. He went into the wheel house the day before the ship was lost and saw chalked up "S.2W." He asked the quartermaster what it meant, and the reply was, "south two points west." Lieutenant Rooke was cool enough to notice after the ship had struck and the sea was breaking over her that "S.2W." was still chalked up. Therefore, it is certain that "S.2W.," whatever it meant, was the course steered. If any sailor had gone into the wheel house and seen "S.2W." marked up, he would not have asked any question, but would at once have assumed that the ship was steering south two degrees west, as no sailor would think of writing south two points west other than S.S.W. It is probable that the answer given by the quartermaster was one that he thought quite near enough for a passenger. At any rate, working on the point system and the degree system vitiated the only evidence forthcoming as to the course the ship was steering, and which led to the loss of so many lives. If we admit the necessity of working on one system, are the cards to be divided into quadrants or to be marked from 0° to 360°? Much as I like the simplicity of the latter, I don't think we ought to lose touch with the cardinal points in the mariner's compass. Therefore my opinion is in favour of the abolition of all points on the compass card, except the cardinal points marking the degrees from N. and S. to 90° E. and W. The 10° division is sufficient for all what may be called colloquial purposes. If the course given at the standard compass is an exact degree or an exact quarter-point, it will nearly always be a fraction of some kind at the steering compass, they will rarely agree, and the helmsman may have to split the degree, even as he frequently has to split the quarter-point. I have never found helmsmen make any difficulty about it, nor can I conceive the quarter-point division being such a hindrance to exact navigation as in the supposed case given in the paper. But I am not aware of any law in the Royal Navy forbidding to give the course in degrees, and it is commonly so given in the mercantile navy. The author of the paper speaks of dividing the compasses on charts into degrees. I am of opinion that there is no simpler way of working on a chart than with a protractor scale showing the angle between any line of direction and the meridian, and that compasses on charts, and the parallel rulers commonly used therewith, may be dispensed with. With respect to the diagram of the compass card before us, I think the black triangular patches, introduced, I presume, to maintain a resemblance to the point divisions, quite unnecessary. The usual degree divisions at the circumference, with such modifications as may be desirable on the smaller cards, are all that is required. The card may then be lightened by removing the central part, and thus approximated to the ideal card, that is, one having the least possible weight with the greatest possible magnetic power.

Colonel BAYLIS, Q.C.: It seems a pity that this interesting subject should flag for want of discussion. You will therefore excuse me for making a few remarks. I observe that the proposal is to do away with the intermediate points of the

compass and preserve only the cardinal points. I see that the proposed compass card before me is marked N., S., E., W., without the other intermediate points. In the inner circle the degrees are enumerated, as well as on the outer circle. I think, as far as my present observation of it has extended, this is the essential difference between the present and the proposed cards. I have heard the remarks which have just been read, and it occurs to me in this, as in other matters, that if a thing has done very well, let it alone: if it is bad, change it. Nothing leads to confusion so much as unnecessary changes for supposed improvements. Underwriters at Lloyd's prefer to continue the old form of policies long in use, because the language is well known and understood. So with sailors it is better to adhere to terms in common use and with which they are familiar, such as "points of the compass," than "degrees," and follow the maxim, "Stare super antiquas vias," than change for the sake of change. I remember that a thesis was set when I was at Oxford, Μεταβολὴ ἄριστον ἁπαντῶν, "Change is the best of all things," which, it was said, meant "a change for the worse is better than no change at all." I quite agree that there is a danger, as was expressed in one of the papers read to-day, in working the two systems, viz., points and degrees. I venture, having had some experience in nautical matters as a Judge of an Admiralty Court in Liverpool, to make these few observations.

Mr. PENNY (Trinity Pilot): When I accepted the invitation to attend this meeting, I was told that I should learn something about compasses. I had not the privilege of reading this paper until I came into the room. I have noticed the two compass cards in front of me, and I also notice two gentlemen present at this meeting. I had the opportunity of sitting under one of them some years ago, and he taught me a very great deal about the compass, and I think he would advise Lieutenant Stuart not to change old things into new. I am afraid when Lieutenant Stuart wrote his paper he wrote it for the benefit of the navy alone, and could not have had the mercantile marine in view. Many of these papers—it matters not whether the subject is ships or compasses—are written with a view of improving the system and style in the navy. I have the honour of being a Trinity House pilot for the Port of London, and am frequently called upon to pilot some of the largest steamers afloat. It has also been my privilege to work with sailing vessels; but it is very seldom you go on board the large steamers of the present day without finding that grand compass card of Sir William Thomson's; it is one of the finest cards I have ever been afloat with. That card, as Captain Wharton said in his paper, is marked with degrees. There are also other compass cards of equal value marked with degrees, and it is a very rare thing that you go on board any large ship but what you find the course is steered to degrees. In my position as a pilot, I often want bearings. I say, "Give me the bearings of so and so." "Right, Sir." "What is it?" "So many degrees." I say, "Hang degrees! I want it in points." For why? I have been educated to it. I cannot for the moment convert degrees into points, but if they give me the bearing asked for in points, I know exactly what I am doing; but I have found it necessary to have a card printed in degrees for every quarter-point of the compass, both magnetic and true, on a 17° line of variation, with a space for marking the course to be steered. I have found this of great assistance in ships on which the courses are set to degrees. I can assure you I do not stand alone in this, and I say, without fear of contradiction as far as the pilot is concerned, if you alter the compass card from points into marks and degrees, you will make a very great error, and you will not only make a mistake by so doing, but it may be the means of causing many shipwrecks. I do not hesitate to say so. When you come to sailing ships, tell me what sailing ship steers by degrees? Is there one ship in fifty that steers by degrees? Could they steer by degrees? Captain Mayes will bear me out when I say there is not one sailing ship that sails the water that could be steered to a degree. Then why put a card before a seaman that he will not be able to use? Now I come back to the old style of taking 4-point bearings, which you will be unable to do if you take away the points. Many of our old coasters have a compass card painted on their companion hatch or skylight, in order that they may take bearings, their steering compass being in such an out-of-the-way place. You must cater for the sailing ship as well as for the 20-knot steamer; if

you do not, things will go badly, and the compass card, instead of being useful to all, will cause confusion and disaster that may be beyond recall. You may introduce a new card marked with marks and degrees which may be used by the 20-knot steamers, but you will never be able to do away with the good old-fashioned card with its 32 points, so much used by all classes of vessels. If you alter the compass card, as Captain Wharton says in his paper, you will have to alter a very great deal in the Sailing Directions. In every sailing direction I know of, the bearings are given in points, and every examination that a pilot undergoes is given in points and quarter-points. I would just like to let Lieutenant Stuart try to pass a pilot's examination in degrees: I can assure you it is bad enough in points. Captain Mayes spoke about the protractor as a very useful way of working. I assure you there are thousands of captains going to sea that work our coasting boats that could not go and set off a true course by a protractor, as they are only used to magnetic charts. Then why give them a thing that they know nothing about? I speak practically, and I say, Let us keep what we have got: let us keep the compass with the 32 points, and the half-points and the quarter-points in between them. Those who like to steer by degrees can do it, and those who have been brought up to steer by points, half-, and quarter-points, let them have the privilege of doing so: in other words, let well alone. I am not in the habit of speaking publicly, but I was unable to sit and listen to the paper as read without offering my protest against the proposed alteration, and by doing so I trust I have only been doing my duty to my brother seamen.

Mr. ALSTON (Master Mariner): I should like to say a few words on this subject. First, as regards steamships, in these days of great competition, when to make passages it is necessary to cut as many corners as possible, to do so with safety, the exact distance you are off the various headlands must be known before (*viâ* the $26\frac{1}{2}°$ and other methods) as well as when they are abeam. To find your position accurately, a compass card plainly marked with degrees is indispensable for taking correct bearings; also to make a direct course between two distant places you must steer by degrees. Second, regarding sailing ships, as they do not hug the land unless compelled to do so, and cannot steer by degrees, the ordinary compass card divided to quarter-points will, in nearly every case, be found sufficient.

The CHAIRMAN: I am sorry the temperature outside and the reaction after yesterday's festivities seem to have prevented a larger attendance. It now devolves upon me to sum up the criticisms generally. Notwithstanding the thinness of the attendance, I think we have had more pungent criticism than customary, thanks to the kindness of officers who have sent us their thoughts on paper when they were not able to be present. I venture to submit that if the Service were called upon generally to give an opinion it would say, "Let us have the old points which we know from our childhood, and let us have the circle marked in degrees so that we can use it if we want it." It appears to me that Mr. Stuart has started with an excellent idea, but then he seems determined to make everything else subservient to this idea. I should like to point out (this is merely in parenthesis) to those who have had the printed paper, that the passage in which the lecturer proposes to call the division of 10° a "mark" has been erased by him, and was, therefore, not read by the Secretary.[1] That removes the chief objection to the proposals; in fact, the moment that is done away with, the arrangement of numbers on the inner circle appears to me to fall to the ground, and we simply come back to this king of compasses, in my humble opinion, Sir William Thomson's, where the diameter is sufficiently large to enable the degrees to be used for all practical purposes on board ship, as well as giving the old points singularly clearly, making it in every way superior to the Admiralty card. It has been pointed out by the Hydrographer that Mr. Stuart speaks as if people were prevented by some law from using degrees and steering by degrees. That is exactly what struck me when I read the paper. As captain of a ship, I have made it a point in my night orders to leave the course for the officer of the watch always in degrees and not according to the compass

[1] I was obliged to mention this, as the *written* criticisms we had just listened to were based on the paper as it stood before this passage was expunged.—L. B.

points, unless it happened to be one of the cardinal points. We were in the habit of steering by Sir William Thomson's compass, and the navigating officer and myself found it saved us a good deal of trouble. On the other hand, Lieutenant Stuart tells us the custom is to express the variation and deviation in degrees and the courses in points. I am not aware of any law which compels you to do either one thing or another. Surely you can please yourself in the matter. It is quite evident when we come to what have been called the colloquial uses of the compass points that this degree system breaks down altogether. It is ridiculous to talk of an N.45°E. wind. It is simpler to give the rough bearing of an object as "two points before the beam" than to say "20°." In fact, it is perfectly easy to combine the existing system with the innovations which it is proposed to introduce. I should like to ask Captain Mayes a question as to a point in the paper which he read: Was the "Roumania's" course S.2°W. or S.S.W.?

Captain MAYES: Nobody knew.

The CHAIRMAN: Were not you able to clear up the point by working out the reckoning afterwards?

Captain MAYES: She was ashore. It looked as though it might have been either. S.S.W. was the safe course, and she went ashore; the other one was the unsafe one. That is rather assuming she steered the unsafe course, but there is no evidence.

The CHAIRMAN: I should like to express to Mr. Penny our satisfaction at his having attended here and having given us his most practical speech. It is very valuable to us to get men of his stamp, who are closely connected with the merchant service, to give us their views. I do not think, however, he is quite fair; I do think we try to keep in view the requirements of the sea service generally. I do not think we draw the line between what is good for one service more than the other. But it is immensely important to have the opinion of a seaman like Mr. Penny on a paper of this sort before one gives any opinion at all, because it is clear that this is not a Royal Naval business or a mercantile naval business; it is one which affects all seamen. As Captain Mayes, I think, has pointed out, there are not many ships that cross the Atlantic at 20 knots, and they are most distinctly in the minority. As regards the signal books: I should be glad if we could devise some means of giving a course by degrees; at present we cannot, we are reduced to quarter-points still for practical purposes if we are sailing in a fleet and the Admiral gives the course: for one thing you do not steam very fast, and for another you have a great many people to check the reckoning, so you are not likely to make many mistakes. I should like to ask Mr. Penny a question as to compass cards. He has had varied experience, doubtless, of the merchant service: has he ever come across a card in the merchant steamer or sailing ship not marked in degrees?

Mr. PENNY: No.

The CHAIRMAN: Is the Admiralty card much in use in the merchant service?

Mr. PENNY: I do not know what the Admiralty compass card is.

The CHAIRMAN: This diagram shows practically what it is.

Mr. PENNY: Yes, they use that style of card, unless it is on board an old foreigner; you then get a cheap card without degrees.

The CHAIRMAN: It struck me, if you look at the old mariner's compass, perhaps one of the oldest institutions in the world, the subdivisions are even numbers. If you look at the proposed card, you will find that there are nine of these groups or subdivisions. That is an awkward number. Reference has been made to the "4-point bearing," which is much used in navigation; you would have to call it the "45-degree bearing" or "4½-mark bearing"; and there are many other little things which have occurred to me in the practical work afloat in which it is distinctly convenient to have even numbers. To sum up shortly: the verdict of this meeting appears to be against the proposal as it stands. But the point to be remembered is that there is no compulsion about the thing, one way or another. I have done it myself, and the steering by degrees is, I should say, now the rule and not the exception in the Naval Service. It only remains for me now to give our best thanks to the lecturer and to express our regret that he is not present to reply, as it would, no doubt, have given additional zest to this extremely interesting and instructive discussion. No doubt it will cause a good deal of discussion in the Service generally when the paper is printed and circulated.

FOREIGN SECTION.

v. LÖBELL'S ANNUAL REPORTS ON THE CHANGES AND PROGRESS IN MILITARY MATTERS DURING 1892.[1]

Compiled by Colonel H. T. HILDYARD, Commandant, Staff College.

YEAR by year, during the 18 years that have passed since 1875, when v. Löbell's valuable work first appeared, its annual publication has been viewed with ever-increasing interest in military circles. In every military library the well-known green volumes continue to be invaluable as works of reference with regard to all the changes in organization, armament, and drill that have been so numerous during the last quarter of the present century. It is due partly, no doubt, to the intrinsic interest to military readers of the subjects treated of that the work has been so complete a success; but this success has only been rendered possible at all by the intelligence, energy, and discrimination of Colonel v. Löbell, the officer who originated, and has since carried out with such completeness, the publication of the work.

While regretting, therefore, very sincerely, that he has found it necessary, from increasing age, to place the publication in other hands, we are glad to see, from the title of this year's issue, that his name will continue to be associated with the work. From the contents of the present volume, published by Lieutenant-General v. Jarotzky, it is evident that this officer has entered on his task with the determination to maintain the high standard achieved by his predecessor.

The method of general arrangement has not been altered. The first part deals in detail with the armies of the several European States, and a welcome addition has been made in the form of a summary in each case of the composition and strength of the army dealt with.

The second part contains information respecting fortifications, armaments, railways, telegraphs, and other special services, and the tactics of the several arms.

In the third part will be found information regarding the civil war in Chili in 1891, the operations in the German sphere of territory in Africa in 1891–92, and the French operations in Dahomey in 1892.

The following is a *précis* of the matter which appears to be of

[1] v. Löbell's "Jahresberichte über die Veränderungen und Fortschritte im Militärwesen." 19th annual issue: 1892. By Lieutenant-General Th. v. Jarotzky. Berlin: Mittler, 1893. 1 vol. Pp. 584. Price 10 marks.

special interest; it is necessarily greatly condensed, and, consequently, very incomplete. Those who are able to read the work in the original will find no equivalent for it in this *précis*, and they have much to gain by reading the whole book.

GERMANY.

The peace strength, including Staff, is the following:—

Infantry	325,742	all ranks.
Cavalry	66,808	,,
,,	65,034	horses.
Field artillery	50,175	all ranks.
,,	2,314	guns.
,,	92	horsed ammunition wagons.
Foot artillery	17,173	all ranks.
Pioneers	10,537	,,
Train	6,849	,,
Railway and balloon troops	2,268	,,

The following table represents the numbers available for war:—

Year of class.	Age.	Strength of class.	Percentage for casualties.	Strength available.	Category.	Totals, exclusive of 1 year volunteers.	
1892	21	172,515	—	172,515			
1891	22	172,515	3	167,340	Active	517,206	Standing Army.
1890	23	182,836	3	177,351			
1889	24	159,270	5	151,306			
1888	25	161,247	5	153,185	Reserve	611,075	
1887	26	161,193	5	153,134			
1886	27	161,526	5	153,450			
1885	28	142,776	10	128,499			
1884	29	142,521	10	128,269			
1883	30	141,917	10	127,726	1st levy	638,153	Landwehr.
1882	31	141,965	10	127,769			
1881	32	140,988	10	125,890			
1880	33	140,541	15	124,460			
1879	34	131,588	15	111,850			
1878	35	133,808	15	113,737			
1877	36	133,366	15	113,361			
1876	37	133,366	20	106,693	2nd levy	783,484	
1875	38	133,366	20	106,693			
1874	39	133,366	20	106,693			
						2,549,918	

Organization.—The provisions of the Army Bill of 1892, which led to the dissolution of the Reichstag, and which has lately been passed by the newly-elected House, are as follows:—

1st. During the five-years' period from the 1st October, 1893, to the 31st March, 1899, the peace effective of the German army, exclusive of officers and non-commissioned officers, to be fixed at an average yearly strength of 492,068 men.

This average strength is based upon the men of the infantry, generally speaking, serving for two years with the colours.

The number of non-commissioned officers to be fixed yearly in the same manner as that of the officers, surgeons, and officials, in the Estimates. The one-year volunteers not to be included in the peace strength.

2nd. From the 1st October, 1893, the organization of the army to be as follows:—

Infantry	711	battalions.
Cavalry	477	squadrons.
Field artillery ...	494	batteries.
Foot artillery	37	battalions.
Pioneers	24	,,
Railway troops ..	7	,,
Train	21	,,

Bavaria, Saxony, and Württemberg are to take their share in the new formations.

3rd. Compared with the existing condition of the army, the following new formations will be required:—

Infantry, 173 battalions of 2 companies.

Cavalry, 1 regiment of 3 squadrons and 9 reserve cadre squadrons (Bavarians).

Field artillery, 20 division staffs, 60 batteries, and 1 division staff and 3 batteries for the field artillery practice school.

Foot artillery, 2 staffs for inspection districts, 3 regimental staffs, 6 battalions and 1 company, 1 battalion staff and 1 company at the school of gunnery.

Pioneers, 3 pioneer commanders in place of 2 fortress inspectors, 3 battalions, 1 battalion staff, and 3 companies.

Railway troops, 1 regimental staff, 2 battalion staffs, and 9 companies.

Train, 1 company and 17 transport detachments for the foot artillery.

As regards the infantry, provision is made, also, for increased establishments, which is considered an indispensable condition of the shortened service, by means of which a sufficient number of trained soldiers will be present throughout the year to perform the necessary duties, and a sufficient parade strength available during the training period of the recruits.

Other organic developments have also been rendered necessary by the increase of the army and the shortening of the period of service with the colours, viz.:—

Extension of cadet corps, non-commissioned officers' schools, and preparatory schools.

Increase of re-engagement pay to non-commissioned officers, and the introduction of a bounty on their re-engagement.
Increase of prizes for skill at arms and for good shooting.
Increase of the allowance of ball ammunition for small arms.
Means for the adequate training of the unattached officers of the field and foot artillery.
Increased means for exercising the unembodied portion of the army as it increases in numbers.

Distribution of Recruits.

To each infantry battalion on the higher establishment	244
„ „ „ medium establishment	228
„ „ „ lower „	209
„ jäger battalion, higher establishment	232
„ „ „ medium „	216
„ „ „ lower „	199
„ cavalry regiment, higher establishment	160
„ „ „ medium and lower establishment	150
„ horse artillery battery, higher establishment, at least	35
„ „ „ medium „	32
„ „ „ lower „	25
„ field „ higher „	38
„ „ „ medium „	35
„ „ „ lower „	30
„ battalion of foot artillery, higher establishment	210
„ „ „ lower „	168
To the guard pioneer battalion	225
To each of the other pioneer battalions	176
„ battalion of the railway regiment	135
To the balloon detachment	15
To each train battalion for three years' service (two have 18)	15
„ „ „ six months' service	38

Training of the Reserves.—36,500 infantry were called up from the Army Reserve, and 61,100 from the Landwehr, making, together, 97,600 men; jägers, 2,700; field artillery, 10,000; foot artillery, 5,000; pioneers, 3,000; railway troops, 772; and train, 5,100; total, 124,172.

Of the "Ersatz" Reserve in these numbers, there were 9,160 infantry, 300 jägers, 1,150 foot artillery, 630 pioneers, 810 train.

The Reserve men of the infantry, jägers, cavalry, field artillery, and pioneers, were generally incorporated with the troops of the line; those of the foot artillery, the railway brigade, and the train, were dealt with specially.

The landwehr men were exercised, the infantry in companies, or, where the conditions of the station permitted, in battalions; the jägers incorporated with the jäger battalions, the field artillery in special batteries, the foot artillery in companies, or, at the practice grounds, in battalions; the pioneers with the pioneer battalions, the

railway troops and train men with the Reserve men of the same formations.

The landwehr men of the cavalry, part with the cavalry, part with the field artillery, and part with the train.

The Ersatz Reserve men were distributed throughout all the army corps, with the exception of the Guard Corps, where the different classes for training purposes were formed in separate companies; those only who were up for their third months' exercise were embodied with line companies.

Belgium.

The organization for war and the strength of each portion of the mobilized army are as follows:—

	Officers.	Other ranks.	Horses.
1st. The field army, consisting of 4 army divisions and 2 cavalry divisions	2,205	66,291	19,154
2nd. The fortress troops, composed of mobile troops for the defence of the large fortresses, garrison troops, Ersatz troops, and administrative services	1,605	59,018	3,462
3rd. The gendarmerie	47	2,082	1,266
Total	3,857	127,391	23,882

To complete these forces there should be available:—

Active army:—		
Volunteers	12,468	men.
Eight yearly classes, Militia (1885 to 1893)	93,156	,,
Together	105,624	,,
Reserve:—		
9th and 10th classes	21,496	,,
11th, 12th, and 13th classes	30,243	,,
Together	51,739	,,

If the last three and oldest classes be disregarded, the total available would be about 140,000 men.

The fortress troops are organized in the following manner:—

For Liége, 1 brigade of 4 battalions of the active army.
For Namur, 1 regiment of 2 battalions of the active army.
For Antwerp, 1 mobile division (5th), composed of 1 carbineer battalion, 5 reserve infantry regiments of 2 battalions, 1 cavalry regiment of 4 squadrons, 6 Reserve field batteries.

The garrison troops are separate, and consist of 14 Reserve in-

fantry regiments (28 battalions), 4 fortress artillery regiments, 12 engineer companies, and special services.

The Ersatz troops are united in separate formations, viz., 19 infantry, 8 cavalry, 4 field artillery, 4 fortress artillery, 1 train, and 1 engineer unit.

Recruiting.—The completion of the army is effected by means of volunteers and of the yearly levy. The obligation to serve extends over eight years, but, in case of war, there is power to call up as many of the yearly classes that have been dismissed as may be found necessary.

Substitutes are allowed on payment of 1,500 francs.

The periods of actual service with the colours are as follows :—

28 months, during the first 3 years of the obligatory period, if belonging to the infantry of the line, the rifles, or train.

36 months, during the first 4 years, for men of the grenadier or carbineer regiments.

3 years for the fortress artillery, engineers, &c.

4 years for the cavalry or field artillerymen.

Organization.—Since June, 1892, Belgium has been divided into four division districts. The first embraces East and West Flanders, with the town of Ghent as headquarters. The second is formed by the province and city of Antwerp. To the third are allotted the provinces of Liége, Limburg, and Luxemburg, with the town of Liége. The fourth includes the provinces of Brabant, Hainault, and Namur, with Brussels as headquarters.

Each province is divided into military districts, which are subdivided into military cantons.

The administrative services are provided for by a battalion of 4 companies, each composed of 6 sections. Of these, 3 are concerned with provisions, viz. :—The 1st section furnishes field ovens, the 2nd deals with slaughter cattle, and the 3rd with forage. The remaining three provide for the auxiliary services, viz. :—The 4th section with field hospital service, the 5th with the veterinary duties, and the 6th with chaplains.

The administrative districts have been made identical with the division districts, the number having been reduced for the purpose from eight to four. There are two intendants at the headquarters of each district, under whom the immediate superintendence of the supply and hospital establishments is exercised by 11 military subintendants.

To each division district there are allotted an artillery, a fortification, and a sanitary direction, as well as an administration company.

The 1st artillery and fortifications direction is formed at Termonde, the 2nd at Antwerp, the 3rd at Liége, and the 4th at Namur.

In each of the fortresses of Antwerp, Liége, and Namur there is a special staff under the orders of a General, who acts as president of a committee for the study of these positions. The directions of artillery and fortifications are members of these committees within the sphere of their districts.

Mobilization.—On the first day of mobilization, the companies and batteries mentioned below are subdivided in the manner described, so that each portion becomes a separate administrative unit.

1st. Each of the four Reserve batteries told off to horse the ammunition columns is divided into three subdivisions, which horse three artillery ammunition columns.

2nd. The artillery pontoon company forms three subdivisions; the 1st and 2nd form the bridging-train of the field army, the 3rd furnishes the pontoon detachment for the Scheld.

3rd. Each of the seven train companies forms three subdivisions, and they are disposed as follows :—

The 1st subdivision of the first five companies (allotted for services connected with the four army divisions and the mobile division (5th)) furnishes the 1st infantry ammunition column and a supply detachment. The 2nd subdivision provides for the 2nd infantry ammunition column, the engineer park, and the 2nd provision column (there is none with the 5th Division). The 3rd subdivision provides for the sanitary detachment of the division, the 1st provision column, and the horse depôt.

The 6th company furnishes one subdivision (1st) to form the train of the 1st Cavalry Division ; the 2nd subdivision goes to the 2nd Cavalry Division; the 3rd provides for the requirements of the Antwerp position.

The 7th company forms, with its 1st subdivision, the train for headquarters, including a sanitary detachment; the 2nd provides for the Liége position, and furnishes a train detachment for Diest; the 3rd for Namur, with detachments for Termonde.

4th. The engineer pontoon company is doubled, and forms a fortress pontoon company and a torpedo company.

5th. The field telegraph company is divided into three subdivisions, and these each into two sections. The first four sections provide for the telegraph service of the four army divisions; the 5th and 6th sections are employed respectively with the telegraph service at headquarters, and on the permanent lines.

6th. Each of the four administration companies is divided in the following manner:—The 1st company (East and West Flanders) provides for the services of the 1st Army Division, the 2nd Cavalry Division, and the fortress of Termonde. It is divided into seven subdivisions; the 1st furnishes a hospital in Termonde, the 2nd and 3rd provide the 1st and 2nd field hospitals for the 1st Army Division, the 4th subdivision the supply establishments at Ghent, the 5th those at Termonde, and the 6th and 7th the administrative detachments for the 1st Army Division and the 2nd Cavalry Division.

The 2nd company (province of Antwerp) provides the services for the 2nd army, the mobile (5th) division, and the Antwerp position. It is divided into 10 subdivisions: the 1st subdivision forms a hospital in Antwerp; the 2nd a hospital in Malines; the 3rd and 4th form the 1st and 2nd movable field hospitals for the 2nd Army Division: the 5th forms a movable field hospital for the mobile (5th) division; the 6th, military flour mills and bakery at Antwerp; 7th, military

abattoir, preserved provision factory and forage magazine, also at Antwerp; 8th, supply establishments at Malines; 9th and 10th subdivisions, the administration detachments for the 2nd Army Division and the mobile (5th) division respectively.

The 3rd company (provinces of Liége, Limburg, and Luxemburg) provides for the 3rd Army Division, the 1st Cavalry Division, and the Liége position. It is divided into seven subdivisions; the 1st forms the hospital in Liége; the 2nd at the camp of Beverloo; the 3rd and 4th form the 1st and 2nd mobile field hospitals of the 3rd Army Division; the 5th, the supply establishments in Liége; the 6th and 7th subdivisions, the administrative detachments for the 3rd Army Division and 1st Cavalry Division.

The 4th company (provinces of Brabant, Hainault, and Namur) provides for the 4th Army Division, the army headquarters, the Namur position, and the fortress of Diest. It is divided into 14 subdivisions: the 1st to the 5th form hospitals at Brussels, Viloarde, Loewen, Diest, and Namur respectively; the 6th and 7th, the 1st and 2nd mobile field hospitals of the 4th Army Division; the 8th, the supply establishments at Brussels; the 9th, military bakery at Viloarde; the 10th to the 12th, the supply establishments at Loewen, Diest, and Namur respectively; the 13th and 14th subdivisions, the administration detachments for the 4th Army Division and Army Headquarters.

The 2nd company also forms the Ersatz unit. In the event of mobilization, the newly called up contingent joins this company, and it acts as a reserve to the others.

Denmark.

On the peace establishment, the army numbers 778 officers, 1,699 non-commissioned officers, 332 musicians, and 11,121 others. It is disposed in two general commands. In the first are comprised the body guard, 2 infantry brigades of 2 regiments of 3 battalions, each of 4 companies, 2 cavalry regiments of 3 squadrons, 1½ artillery regiments of 2 divisions of 3 batteries, the fortress artillery, consisting of 2 battalions, and the engineer regiment, composed of 5 ordinary and 3 reserve companies.

The 2nd general command comprises 3 infantry brigades, 3 cavalry regiments, and half an artillery regiment.

There belong also to the army the gendarmerie, consisting of 22 officers, 104 non-commissioned officers, and 413 men, and, further, the cadres for the following:—

1 body-guard battalion,
10 battalions (1 for each regiment),
2 battalions for Copenhagen,
4 batteries (1 for each division),
5 artillery companies,

besides the reinforcement for Bornholm.

On the war establishment the following is the strength of the several arms:—

	Officers.	Non-commissioned officers.	Musicians.	Others.
Superior staffs, &c.	29	16	—	—
Infantry (31 battalions) 1 body guard battalion, 5 brigades of 2 regiments, 11 depôts.	799	2,015	243	31,532
Cavalry (15 squadrons) 5 regiments of 3 squadrons, 1 orderly squadron, 5 depôts.	138	262	50	2,045
Artillery (12 batteries), 6 companies) Field artillery (2 regiments of 2 divisions of 3 batteries). Fortress artillery (2 battalions, depôts, and train).	187	391	33	4,660
Engineers (11 companies) 1 regiment of 11 field companies, depôt company.	61	152	6	1,524
Total ..	1,214	2,836	332	40,000 (about)

The cadre formations are also completed, and the strength of the 13 battalions thus raised to 245 officers, 560 non-commissioned officers, 17 musicians, and 13,143 men. But as, apparently, the battalions would be increased from 4 to 6 companies, the reinforcement available in these battalions should really amount to at least 20,000 men.

France.

The peace establishment for 1892 was, inclusive of the gendarmerie, 28,107 officers and officials of corresponding rank, and 542,496 men, from which about 56,915 must be deducted for non-effectives. For 1893 there is a small increase, the numbers being 28,382 officers, &c., and 543,908 men.

The strength, estimated on the basis of the total number of men who have received military training that would be available, is stated by the French publication, "L'Armée Militaire et Maritime pour 1892," to be 4,372,000. For the purposes of the Bill regarding the future peace strength of the German army, it was taken to be 35 yearly classes of 230,000, with 25 per cent. deduction for casualties, which would make the numbers about 4,053,000.

The number of units to be completed in the Active Army, the Reserve formations, and the Territorial Army, are the following:—

	Battalions.	Squadrons.	Field, horse, and mountain batteries.	Fortress and foot batteries.	Engineer battalions.	Train squadrons.
Active Army	584	438	480	100	22	20
Reserve troops.....	435	180	216	—	—	—
Territorial Army... ..	458	78	229		19	19

There are also the forest and customs formations, comprising 67 independent companies, 38 battalions, 56 independent sections and detachments.

There are, further, the marine troops in the interior of France:—

8 regiments of marine infantry with 116 companies.
22 batteries of marine artillerymen.

Alterations in the Organic Law.

By Article 1 of the Law of the 19th July, 1892, Articles 37, 49, and 64 of the Law of the 15th July, 1889, are altered to read as follows:—

Article 37.—Every Frenchman declared to be physically fitted for military service shall belong—

To the Active Army	for	3	years.
„ Reserve of the Active Army.....	„	10	„
„ Territorial Army	„	6	„
„ Reserve of the Territorial Army..	„	6	„

(The Active Army Reserve obligation has been lengthened by three years, and the term in the reserve of the Territorial Army correspondingly diminished.)

Article 49.—The men of the Active Army Reserve are subject to two trainings while belonging to it, each of four weeks' duration.

The men belonging to the Territorial Army will be called up only for one training of two weeks' duration.

The breadwinners of families subject to these exercises may be exempted up to the number of 6 per cent. of those called up.

The men of the Territorial Army Reserve may be called up to report themselves during the period of their service in it, but it must not entail absence from their residence of more than one day.

Article 64.—The provision of paragraph 2, by which cavalrymen who had to serve four years in the Active Army only had to serve four years in the Reserve, and passed into the Territorial Army and its Reserve three years earlier than others of their class, has been cancelled.

Article 2.—The officers of the active category and of the Reserve are attached to the formations of the Active Army, and the territorial officers to those of the Territorial Army. Officers of the active category and of the Reserve may, if military exigencies require it, be

transferred to the territorial formations, at the discretion of the Minister of War; whereas territorial officers can only be attached to formations of the Active Army with their consent.

The officers retired on pension remain during the period fixed by law (five years from the date of their retirement) at the disposition of the Minister of War, who may employ them at his discretion.

Article 3.—The following addition is made to Article 56 of the Law of the 13th March, 1875:—

"The Minister of War is empowered to retain on the cadres those officers who, having passed the limit of age, are fitted and willing to be employed at the depôts or in the military establishments (the age limit is 65 years for superior officers, and 60 for subordinate officers)."

According to the "Progrès Mil.," No. 1206, these changes have for their object to assimilate more the component portions of the previously existing mixed regiments, which consisted of one active battalion and two territorial battalions. Under former conditions, the training and utilization of the troops suffered, and combined with this was the drawback that, on the outbreak of war, those belonging to the Territorial Army had to take the field, whereas younger Reserve men remained behind in the formations of the second line. The same conditions prevailed with the cavalry and artillery. The 10 yearly classes which now constitute the Reserve are sufficient to complete the previously existing mixed regiments, which now have the title of Reserve regiments, and allow of formations being completed, from which men of the Territorial Army are excluded, and which are at once ready for service in the field.

Bill with regard to the Constitution of the Cadres and the Effectives of the Active and Territorial Armies.

The object of the new Law is described in the following terms in the preamble:—The new Law has for its object not an actual increase to the army, but only a different arrangement of the establishment within the limits of the budget. The increased expenditure resulting from it will be met by economies under other heads. In accordance with the Laws of the 24th July, 1873, and the 13th March, 1875, our armed forces are divided between the Active and the Territorial Armies; the former, exclusive of the garrisons in Algeria, consisted of 144 infantry regiments, 30 rifle battalions, 70 cavalry regiments, 400 batteries, and 4 engineer regiments, which were formed in 18 Army Corps; the latter, the Territorial Army, was composed of a similar number of infantry regiments, and about a fourth of the squadrons and batteries existing in the active army. But the increase of their armed forces by other States necessitated a similar increase in France which comprised the raising of the following new formations:—

16 fortress artillery battalions,
18 regional infantry regiments, each of 3, later to be of 4, battalions,
13 cavalry regiments,

24 rifle companies,
12 mountain batteries,
35 field batteries,
1 railway regiment,
1 infantry regiment (No. 163).

Further increases could not be effected without entailing on the country considerable sacrifices, both as regards money and men, and this led to the idea of limiting further action to the development of the Reserve formations destined to reinforce the field army, the maintenance of which, in peace, only entails small expense. By the Law of the 15th July, 1889, which established the principle of universal service without any exemption, and prolonged the period of service from 20 to 25 years, the strength of the annual Ersatz contingent was increased by a third of what it was, and, by this means, it became possible to form in each subdivision district, besides the previously existing territorial infantry regiment, two battalions from the youngest classes of the Territorial Army, and a fourth battalion, composed of Reserve men, to each active regiment. These three battalions were formed in each subdivision district into a "mixed" regiment, and a large number of these regiments took part in the Autumn Manœuvres from 1890 to 1892. Although these formations were shown to be adapted to service in the field, still their organization left much to be desired in many respects, for two battalions were composed of men from the Territorial Army, and one of Reserve men; the officers, equally, were of no common standard. The first defect was remedied by the Law of the 19th July, 1892, which increased the period of service in the Reserve by five years. The object now to be attained is to provide that the former regiments (*mixtes*) which have now been renamed Reserve regiments, and which are already commanded by the lieutenant-colonel of the corresponding active regiment, shall be provided, for all posts of and above the rank of captain, with active officers, who are already available in time of peace.

Organization.—On the 1st February two new infantry divisions, the 39th and 40th, were formed out of the St. Mihiel division, which was broken up, and the 147th, 148th, 150th, and 161st Infantry Regiments. On the 1st April, 4 rifle battalions and 2 infantry regiments were formed into the Vosges Division, destined to occupy and defend the passes of the Vosges district in time of war.

Three batteries each from the 24th and 35th Divisions, were incorporated in the 39th Division; 3 batteries, each from the 25th and 31st Divisions, were allotted to the 40th Division; and 3 batteries from the 9th Division, and one from the 6th Artillery Regiment, to the Vosges Division.

These three new infantry divisions are placed under the General commanding the 6th Army Corps; they are distributed as follows:—

39th Infantry Division, Commercy:—
77th Infantry Brigade, Commercy.
154th Regiment, Commercy.
162nd Regiment, Lerouville.

78th Infantry Brigade, Toul.
156th Regiment, Toul.
160th „ „

Artillery of the Division, St. Mihiel:—
7th, 8th, and 9th Batteries, 24th Artillery Regiment.
7th, 8th, and 9th Batteries, 35th Artillery Regiment.

40th Infantry Division, St. Mihiel:—
79th Infantry Brigade, Verdun.
147th Regiment, Verdun.
148th „ „
80th Infantry Brigade, St. Mihiel.
25th Rifle Battalion, St. Mihiel.
26th „ „ „
150th Regiment, Verdun.
161st Regiment, Châlons Camp.

Artillery of the Division, Verdun:—
7th, 8th, and 9th Batteries, 25th Artillery Regiment (provisionally at Châlons Camp).
7th, 8th, and 9th Batteries, 31st Artillery Regiment, Verdun.

Vosges Division, Remiremont:—
1st Brigade, Remiremont.
152nd Infantry Regiment (3 battalions), Épinal.
15th Rifle Battalion (6 companies), Remiremont.
19th Rifle Battalion, Troyes.
2nd Brigade, St. Dié.
149th Infantry Regiment (3 battalions), Épinal.
10th Rifle Battalion (6 companies), St. Dié.
17th „ „ Rambervillers.

Artillery of the Division, Remiremont:—
9th battery, 6th Artillery Regiment, Remiremont.
9th „ 9th „ „ „
7th and 8th batteries, 9th Artillery Regiment, Bruyères.

Native Troops.—On the 23rd April, instructions were issued for the formation of a regiment of Soudanese rifles, to consist of natives, and composed of 2 battalions, each of 4 companies; it will subsequently form part of the colonial army.

Each company is to consist of 3 European officers and 1 native officer, 10 European non-commissioned officers and 20 native ones, 132 native riflemen and 4 buglers.

The 5 existing companies of Senegal rifles and 1 company of Soudan rifles were incorporated in the new formation; only 2 new companies had to be raised. The European elements were taken from the marine infantry. The whole of the officers are mounted. The natives are recruited voluntarily from the territory comprised in the French Soudan and Senegal.

Interior Economy.—On the 20th October, new regulations were issued respecting the interior economy in the infantry.

Signallers.—In February the signallers, who were previously maintained with every body of troops, were done away with, excepting only in the Vosges Division and in the 14th and 15th Army Corps, in which, however, the number of signallers previously authorized was reduced by a half.

Cyclists.—Instructions, dated 2nd April, regulate finally the organization of the military cycle service and point out the advantages of cycles as a means of communication, the use of which should, however, be confined to roads, for conveying orders and communications of any kind, also, exceptionally, in connection with outpost duties. In peace they are used for orderlies. In war they are ridden by men taken from the reserve and the territorial army, who, previous to the completion of their active service, have proved themselves fit for the work. These men wear a special uniform, similar to that worn by the Alpine Rifles, and a distinguishing band on the arm. They are attached as supernumeraries to the staffs and troops at the rate of 4 per infantry regiment and 2 per cavalry regiment. The bicycle only is employed.

Field-firing.—From 1893, 80 infantry regiments and all the rifle battalions are to be exercised in field-firing under service conditions at special exercise grounds set apart for the purpose. It is to be continued for seven days, exclusive of the time occupied in marching to and fro.

Company Wagons.—Instructions were issued to the troops in January regarding the employment and distribution of the company wagons (one per company), which replace the previously existing battalion ammunition wagons, the mules for the transport of entrenching tools and the regimental store wagon. The load of a company wagon consists of 16,000 rounds of ball ammunition, disposed in two ammunition boxes, 34 pioneer tools and two fascine knives. In the wagon belonging to the 1st company there are, besides, pincers, handsaws, and a box of finer tools. In the place of the ammunition, 54 packs can be carried on the wagon, which is arranged to admit of this. It is a principle that the ammunition carried by the wagons should be distributed before the commencement of an action. The four company wagons of each battalion should, as a rule, be formed into a group and form part of the fighting train, which in principle would always remain with the troops. After the ammunition has been issued, the wagons remain at the disposition of the commandant concerned: they are not sent back to replace the ammunition, for it is the duty of the ammunition section to bring, if necessary, ammunition wagons up to behind the fighting line, whence the cartridges are distributed to the firing line, by means of bags, by men detailed for the purpose.

Cavalry.

Remounts.—The requirements, as regards horses of the cavalry on mobilization, are estimated, in an article in "La France Mil.,"

No. 2489, at 56,585 riding and about 6,000 draught horses. It is reckoned that the marching-out strength of a cavalry regiment, 660, requires with the cavalry divisions 667 horses, and the mounting of 38 reserve regiments and 18 new squadrons for the requirements of the independent cavalry divisions, the depôt squadrons, &c., will necessitate the purchase of about 60,000 horses.

Native Troops.—At the commencement of 1892 a new squadron was raised in the Soudanese territory and called the Soudanese Spahis. It consists of 8 officers and 178 Spahis, and is attached to the 1st Spahis Regiment. The non-commissioned officers are drawn partly from Frenchmen and partly from natives; the men, by voluntary engagement or by transfer from the Senegal Spahis.

Territorial Army.

During the spring and summer, effect was given to the Law of the 27th July, 1892, by the creation of 13 rifle battalions in the 14th and 15th Army Corps districts.

The raising of more territorial rifle battalions, to which only those men will belong who have served in active rifle battalions, is under consideration.

The decree of the 13th November, 1876, respecting the military organization of the forest officials in Algeria, has been completed by the following arrangements:—

In each department in Algeria the forest officials are to be formed into sections, the cadres of which will consist of 1 captain as commandant, 1 lieutenant or sub-lieutenant, 1 sergeant, and as many non-commissioned officers as the section contains detachments. Each forest district provides, as far as is practicable, the personnel for one section. The employés are to be mounted in war. The sections have for their duty to support any military operations within their respective districts, to participate in the defence of isolated places, and to watch the communications. From the commencement of mobilization these formations are under the orders of the General commanding the 19th Army Corps.

Means were provided for the exercising of 9,100 officers and about 138,000 men of the Territorial Army, mostly belonging to the 1878 and 1879 classes. The total number of trained men belonging to the Territorial Army was estimated by "L'Armée Militaire et Maritime" to have been about 1,237,000 at the beginning of 1893.

Greece.

The peace establishment of the army for 1892 was 1,890 officers, 26,224 men, and 3,739 horses and mules. The effective, during 1892, fluctuated between 18,000 and 20,000, and at the end of the year it fell as low as 16,000.

The war strength at the conclusion of a period of mobilization of at least two months should be the following:—

38 existing infantry battalions. 15 infantry battalions to be formed. 1 Erzone battalion to be formed.		
54 battalions, 1,000 strong.....	54,000	men.
12 existing cavalry squadrons. 3 cavalry squadrons to be formed.		
15 squadrons of 150 horses	2,250	„
20 existing batteries. 10 batteries to be formed.		
30 batteries of 6 guns and about 130 men	4,000	„
2 existing engineer battalions. 1 battalion to be formed.		
3 battalions, 1,000 strong.....	3,000	„
Auxiliary troops (train, &c.).....	3,000	„
Total .. 180 guns and	66,250	„

It appears, from official sources, that at the end of 1891 there were, in round numbers, 150,000 Reserve men available. This number, after deducting the natural waste, forms a sufficient reservoir in men for the formation of the field army. As regards the new formations proposed, nothing further can be said, for the required numbers of officers and non-commissioned officers are not available.

GREAT BRITAIN.

	Establishment.	Effective strength.	Available for the field army in Europe.	Available for India.	Available for home defence.
Standing army	216,799	211,590	103,891[1]	71,620	103,891
Army Reserve, 1st Class	71,800	68,421	68,421	—	68,421
Militia.....	135,725	112,201	31,264	—	112,201
Yeomanry	14,086	10,710	—	—	10,700
Volunteers	261,224	222,046	—	88,848	222,046
Total.....	699,634[2]	624,968	203,576	160,468	517,259

[1] 29,586 men in the colonies. The numbers refer to the 1st January, 1892, with the exception of those relating to the Volunteers, which refer to the 1st November, 1891.

[2] The total in the original is given as 702,614.—ED.

Taken by arms and branches of the Service the following table shows the numbers of units and the strength of each portion of the forces.

January 1, 1892.	Infantry.	Cavalry.	Horse, field, and mountain artillery.	Garrison artillery.	Royal Engineers.	Colonial troops.	Army Service Corps.	Ordnance Store Corps.	Medical Staff Corps.
Standing army	148 batts.	31 regts.	20 batts. 2 dep'ts	68 cos.	37 cos.	36 cos.	39 cos.	4 cos.	17 divs.
	69 depôts	10 depôts	84 batts. 4 dep'ts 10 batts.	9 depôts	—	—	—	—	—
Strength	138,773	19,395	19,378	16,304	7,431	3,265	3,467	4 603	2,374
Army Reserve	49,193	4,663	6.833	—	1,535	127	2,195	199	1,059
Militia and Yeomanry	89,733	10,710	—	14,482	1,942	—	—	—	—
Volunteers ...	166,162	293	—	41.077	13,161	—	—	—	1,517
Total ...	443,861	35,061	19,378[1]	78,896[1]	24,226[1]	3,428[1]	5,662	4.802	4,948[1]

The disposition of the forces for home defence is given in detail. It is summarized below.

1st. The field army:—

4 cavalry brigades, 12 cavalry regiments, 8 companies mounted infantry, 4 horse artillery batteries, 16 machine-guns.

1st Army Corps—25 battalions, 1 cavalry regiment, 15 field artillery batteries, 14 machine-guns.

2nd Army Corps—25 battalions, 1 cavalry regiment, 14 field artillery batteries, 14 machine-guns.

3rd Army Corps—28 battalions, 1 cavalry regiment, 12 field artillery batteries, 14 machine-guns.

Total:—78 battalions, 15 cavalry regiments, 45 field artillery batteries, 58 machine-guns, and 8 companies mounted infantry.

ITALY.

Peace Strength.—The establishment for 1893–94 was fixed at the following numbers:—

	Establishment.	Effectives.
Officers.....	14,199	14,074
Men	259,091	204,150
Officers' horses	11,343	11,760
Troop horses.....	38,986	36,965

The number of units of each arm and their strength are as follows:—

[1] These are the totals given in the original.—ED.

Infantry.[1]		Cavalry.		Field artillery.	
Regiments	115	Regiments.....	24	Regiments	24
Battalions	346	Half-regiments..	48	Divisions	48
Companies	1,371	Squadrons.....	144	Batteries	192
Strength.....	156,754	Strength	26,832	Strength	23,988
		Horses	22,920	Horses	12,612
				Guns	768

	Horse artillery.	Mountain artillery.	Fortress artillery.	Engineers.
Regiments	1	1	5	4
Divisions	3	3	17	24
Batteries	6	9	68 (companies)	64 (companies)
Strength	1,231	1,257	7,559	8,520
Horses.....	771	623	310	834
Guns.....	36	54		

There are besides, not included in the foregoing, 87 district commands with 98 permanent companies, with 757 officers, 87 medical officers, 460 pay officers, and 9,859 men.

Further, there are the Carabinieri Reali with 611 officers, 24,568 men, and 4,962 horses, and also 12 sanitary and 12 supply companies, the strength of which varies according to the requirements.

Each of the 12 army corps numbers 27 infantry battalions; the rest of the troops are not permanently and uniformly allotted to army corps during peace.

War Strength, larger Formations.

	Officers.	Men.	Civilians.	Horses.	Vehicles.	Guns.[2]
Superior headquarters ..	85	614	83	524	58	—
Each army (3 army corps, 1 cavalry division) .. .	3,536	114,484	1,612	25.841	5,056	300
Each army corps	980	34,617	24	5,777	1,098	96
An infantry division....	375	13,935	5	1,099	220	24
A cavalry division.....	222	4,017	5	4,173	166	12

The actual combatants are:—

Army corps	27,262 rifles (infantry),		764 sabres,	96 guns.
Infantry division ..	12,143	,,	—	24	,,
Cavalry division ..	—	3,062	,,	12	,,

[1] Bersaglieri and Alpine troops included. The strength of these is 16,020 and 10,174 respectively.

[2] The guns are also included in the number of vehicles.

The available strength for war, including all classes of the forces, was, on the 1st January, the following :—

	Officers.	Men.
Standing army.....	20,143	819,226
Officers of the administration ...	2,334	—
Mobile Militia.....	4,183	504,396
Special Militia (Sardinia)	—	20,772
Territorial Militia	5,862	1,639,336
Officers unemployed	4,798	—
Total....	37,320	2,983,730

Reduction in the Peace Establishment of Officers.—In consequence of financial exigencies, reductions have been made by the Law of the 18th February, 1892, viz., 717 officers, including 12 generals, 12 general staff officers, 576 infantry (including 493 lieutenants and sub-lieutenants), 27 artillery, 6 medical, 16 commissariat, 15 pay officers, 13 veterinary surgeons, 49 officers not belonging to regiments, making in all 726 reductions. On the other hand, the establishment of the engineers was increased by 9 officers, making a net reduction of 717 officers.

After the terms of this Law shall have been completely carried out, the infantry will still have three officers per company, though the total number of lieutenants will be reduced by one-ninth.

Cavalry Formations.—A new cavalry brigade organization was introduced in October last :—

1st	Brigade, regiments	Piemonte Reale, and Lodi.
2nd	„ „	Vittorio Emanuele, Saluzzo, and Caserta.
3rd	„ „	Nizza, Genova, Firenze, and Piacenza.
4th	„ „	Savoia and Vicenza.
5th	„ „	Lucca and Roma.
6th	„ „	Aosta, Alessandria, and Umberto 1st.
7th	„ „	Montebello, Foggia, and Catania.
8th	„ „	Novara, Monserrato, and Padua.
9th	„ „	Milan and Guide.

Territorial Militia.—A Royal Decree of the 11th July, 1892, which is to be converted into a Law, directs the formation of officers' cadres for the Territorial Militia. According to the instructions of the War Minister regarding it, lieutenant-colonels, majors, captains, lieutenants, and sub-lieutenants are to be nominated, principally from officers of all arms who have served in the army; but, as is also the case with the other Territorial Militia formations, suitable civilians may be appointed, provided they pass successfully the required examination; they may, however, be only employed as sub-lieutenants.

Organization for War.—The war strength of the infantry companies has been increased from 5 officers and 225 men to 5 officers and 250 men; consequently, the battalion strength has been raised from 24 officers and 918 men to 24 officers and 1,019 men.

The columns and trains are now provided for army corps of three divisions in place of two, as was the case formerly.

Mobilization.—A considerable advance has been made in the necessary arrangements. The infantry line regiments are not now called upon to give any officers to the Ersatz formations; they each give seven officers to the mobile Militia. Thus the peace arrangements as regards command are disturbed as little as possible. On mobilization it will only be necessary to fill from two to four officers' places with non-commissioned officers.

The Bersaglieri and Alpine formations, with the Ersatz officers who would be called up, have more than enough officers for their requirements.

The cavalry also have more than the number of Ersatz officers required; the total supernumeraries are to be utilized, in part as orderly officers, and partly with the train.

The line field artillery regiments give, on the average, from two to three officers to the mobile Militia, so only a few places have to be filled by non-commissioned officers.

The infantry of the mobile Militia has 223 (only 44 in the preceding year) out of the 576 companies with the regulation number of officers; the remaining 353 companies are each still one subaltern officer short. In about half of the regiments the regimental, battalion, and company commanders, and the adjutants, are all officers from the active list; in the other half the battalion and company commanders are so only in part. The other company officers are taken entirely from the non-active list.

The field batteries of the mobile Militia have, on the average, exclusive of the battery commanders, only two officers. The same applies to the fortress artillery companies of the mobile Militia, and to the artillery of the Territorial Militia.

The endeavour is patent to avoid, as far as practicable, disturbing on mobilization the officers who occupy the position of commanders with the active army in peace-time. Whether, in the infantry, this can be continued with equal success when the projected reductions in the peace establishment of officers of that arm have been carried out, seems dubious.

By an instruction of the 22nd March, 1892, a new method of completing the troops on mobilization has been introduced for the entire army.

The recruiting for the troops is conducted, with a few exceptions (as in the case of the Alpine formations, the mountain and field artillery, the train, and the Venetian lagune pioneers), now, as previously, on the national system, that is for each formation from three different regions (Upper, Middle, and Lower Italy). For political reasons it is not intended to give up this practice. On the other hand, the War Minister has decided to give up the principle, adopted previously, of sending the Reserve men back again to their old regiments on mobilization. It is retained only for the cavalry and the engineers.

The other arms are now to receive the men to complete them to

war establishment territorially: that is from the districts in the vicinity of their headquarter stations.

The arrangement by which infantry regiments would proceed with their peace effective to the place of concentration, and there receive their reservists, collected and clothed in the several districts to which they belonged, has been preserved. Hitherto the regiments received back the men they had trained from Upper, Middle, and Lower Italy, and the district had consequently to send drafts to regiments of most diverse army corps. By the new dispositions for mobilization, the districts have only to form drafts for regiments belonging to their own army corps, and these go all together from the district to the army corps. The change, therefore, introduces a material simplification in the sending of drafts on mobilization. Whether this will, as claimed by the War Minister, effect a saving of from six to seven days in the mobilization period remains to be seen.

Preparations for Mountain Warfare.—Arrangements have been made for rendering those troops that are set apart for mountain warfare more efficient for the purpose. The creation on mobilization of mountain sanitary sections and mountain field hospitals to be allotted to them has been provided for.

Two batteries each of the 5th, 8th, and 11th Field Artillery regiments have been trained in the use of mountain guns; the material is ready to convert them at once into mountain batteries. Lately also the creation of siege parks has been planned.

The whole of the batteries are furnished with ammunition columns, to satisfy the first requirements. The ammunition to replace what is used is forwarded to the front by means of field railways, traction engines, movable columns, and, in the high lands of mountainous country, by special sledges.

To the engineer siege park belong telegraph, railway, and balloon material.

Modifications in Terms of Service.—By the Law of the 28th June, 1891, the duration of the obligatory term of service of the men of the first and second category was prolonged until the 31st December of the year in which the classes

1852	and	1853	complete	42	years of age.
1854	„	1855	„	41	„
1856	„	1857	„	40	„

By the same Law the Minister of War was empowered to delay the passing of men to the Territorial Militia on mobilization until the 31st December of the year in which they complete 15 years of their service obligation.

By this exceptional Law the completion of the army of the second line is guaranteed; but apparently Ersatz Reserve men will still have to be embodied from the first day of mobilization.

By the Organic Law of the 6th August, 1888, the obligation to service was as follows:—

9 years in the	Standing Army	} Total, 19 years from the age of 21.
3 „	Mobile Militia	
7 „	Territorial Militia	

Since the 1st of January, 1892, it has been

9 years in the	Standing Army	} Total, 22 years from the age of 21.
6 „	Mobile Militia	
7 „	Territorial Militia	

Training.—In place of the comparatively costly camps of exercise, lasting from four to six weeks for a portion of the troops only, manœuvres for a period of 10 days, from the 21st to the 31st August, were introduced for the first time for the whole of the army. Two corps, the 7th (Ancona), and the 9th (Rome) had "great manœuvres." Including these two, reinforced by a mobile Militia division, 8 army corps were assembled for corps manœuvres; in four corps districts divisional exercises were held. Besides these, a mobile Militia division was formed at Turin, and its performances were satisfactory. The mountain troops—Alpine formations and the mountain artillery of the three western frontier corps—were exercised as in the preceding year for six weeks.

Recruits were not called up during 1892; the 1892 class were only embodied in March, 1893. The Reserve men, those on furlough subject to recall, and the men of certain categories indicated by the War Minister (for reasons of economy), for example, the men of the 1871 class, born in 1869, who had served one year, were dismissed on the 20th September. It is a matter of importance that the War Minister has decided to change permanently the service year; the recruits to be incorporated at the beginning of March, and the Reserves sent down at the end of October. The period of recruit training has been reduced from four months to eight weeks.

In order not to disturb the instruction during the summer, it has been ordered that ordinary volunteers are not to be enlisted during the period between the 1st May and the 31st October. Their number also has been much reduced; by instructions of the 10th December, 1892, not more than 10 volunteers are to be taken per infantry, Bersaglieri, artillery, and engineer regiment; in the Alpine troops and the cavalry (for three years) their number is unrestricted.

During the winter period, the number of corporals to be reduced by one-third. The infantry suffers the most during the winter period of reduced effectives. Estimated by the numbers dismissed in the autumn of 1892, the average strength remaining per company is only, at most, 49 men. After deducting non-commissioned officers, musicians (2), and pioneers (2), there would only be about 35 men left. According to a statement in the "Esercito Italiano" (No. 3 of 1893), the company strength has really fallen as low as about 25 men.

The infantry received, in 1892, new regulations for drill, musketry, and field duties.

The several courses at the central school of musketry were attended

by 200 lieutenants and 400 sub-lieutenants of infantry, and 48 subaltern officers of cavalry.

There were special exercises for cavalry in reconnoitring duties, viz.:—

From the 21st to 30th August, for two regiments north-west of Milan.

From the 21st to 30th August, for three regiments between Tagliamento and Piave.

From the 7th to 14th September, for six regiments in the Roman Campagna.

Promotion of Officers by Selection.—A voluntary examination has been introduced for captains of infantry and cavalry; by passing successfully they obtain a right to special promotion to the rank of major when they come within the senior sixth of the officers of their rank. Those only are exempted from this examination who have already been recorded as qualified for promotion by selection by the promotion committee of the arm to which they belong. The examination is held in Rome; it comprises the following subjects:—

1. A written essay, with subsequent *vivâ voce* discussion (to test general instruction).
2. Written solution of a tactical problem (as a rule not relating to a force larger than a division).
3. Command of a mixed detachment in the field.
4. Kriegsspiel, in the capacity of a subordinate commander.
5. Riding.

Montenegro.

In peace, including all officers and men employed about the Court, the whole number does not exceed about 2,200. Every physically qualified Montenegrin[1] is liable to serve between 16 and 50 years of age. The 1st class of those liable is composed of men between 20 and 40 years of age, and numbers about 26,000. The 2nd class includes the youths between 16 and 20, and men between 40 and 50, numbering about 10,000. From the 1st class 31 battalions are formed, and 12 from the 2nd class; total, 43 battalions, generally of 6 companies each.

The country is divided up into eight brigade districts, each under a brigadier. The battalions are allotted to these districts as follows:—

1st	Brigade	(Katunska)	7 battalions.
2nd	„	(Crmniča)	6 „
3rd	„	(Piperska and Bjelopavliča)	5 „
4th	„	(Pivska)	7 „
5th	„	(Zetska)	6 „
6th	„	(Vasojeviča)	4 „
7th	„	(Primorska)	3 „
8th	„	(Vasojeviča)	5 „

[1] The Mahommedan population are exempted on payment of a sum of money.

There is one battery of artillery to each brigade district, the matériel for which is allotted to the infantry brigades in peace-time. The battery consists of 2 field guns and 4 mountain guns.

There are no auxiliary services or field establishments.

There are sufficient arms and ammunition for the infantry and artillery formations contemplated.

The patriarchally organized forces are good, and sufficient for the traditional defence of the country, but they are unsuited to aggressive plans. But as allies to their Servian brethren, in the neighbouring roadless and resourceless Austrian and Turkish territories, which are as if created for guerilla warfare, they would constitute an important factor, and be a difficult enemy to suppress.

The Netherlands.

The peace organization is the following :—

Infantry :—

1 grenadier and rifle regiment, 5 battalions, 20 companies.
8 infantry regiments, 40 battalions, 160 companies.
1 instructional battalion, 4 companies.
Strength of all ranks, 44,080.

Cavalry :—

3 hussar regiments, 15 squadrons, 5 depôts.
1 squadron of orderlies.
Strength, 4,100.

Artillery :—

3 field artillery regiments, 6 divisions, 18 batteries, 108 guns, 2 train companies.
1 horse artillery corps, 2 batteries, 12 guns, 1 instructional battery.
4 fortress artillery regiments, 40 companies.
1 armoured-fort artillery corps, 4 companies.
1 instructional company.
1 pontoon corps, 2 companies.
1 torpedo corps, 2 companies.
Strength, 14,513.

Engineers :—1 engineer corps, composed of—

3 field companies.
4 fortress companies.
1 railway and telegraph company.
1 school and depôt company.
Strength, all ranks, 1,715.

There are, besides these, some special corps and local companies, called "Schuttereien," composed of those men between 25 and 35 years of age who do not belong to the army or the navy. In places of 2,500 inhabitants and over these companies are embodied for duty ; of these there are 213, of a strength of 51,391 of all ranks. In places

having less than 2,500 inhabitants, the companies are not embodied in peace; there are 89 battalions to be formed from these, numbering 78,859 of all ranks.

In war, the field army consists of 3 divisions, each composed of 3 infantry regiments of 4 battalions, 1 hussar regiment, 1 field artillery regiment, 1 field company of engineers, with the necessary auxiliary services and transport. The horse artillery is attached to the 2nd Division.

On the special order of the War Minister, a portion of the cavalry can be formed into an independent brigade, and the horse artillery attached to it.

If considered necessary, a pontoon company would be attached to the field army.

The garrison troops would consist of the following:—

The 3rd battalion of the grenadier and rifle regiment.
The 4th battalion of the 8 infantry regiments.
The 4 fortress artillery regiments.
The armoured-fort artillery corps.
The torpedo corps.
The 4 fortress engineer companies.

Terms of Service.—The army is composed of volunteers, who serve eight years and less, and of Militiamen. The annual contingent of the latter amounts to 10,400 men; they are drawn by lot yearly from those who attain 20 years of age and are fit. Substitutes and change of numbers are permitted. The period of liability to serve lasts 7 years, that of service with the colours 1 year; but one-seventh of the Militiamen may be detained, usually for from 4 to 6 weeks, after their year's service has expired.

The obligation regarding service in the "Schuttereien" has been already noticed. There is further the Landsturm, to which all able-bodied men belong who are between the ages of 19 and 50, provided they do not already belong to the army, navy, or local companies.

The Landwehr is to be organized only when the necessity for its employment arises.

Organization.—The country is divided into 3 military districts, commanded by Major-Generals. Their headquarters are at Amsterdam, Utrecht, and Breda respectively. There are also 7 artillery and 4 engineer commands.

The headquarters of the 3 infantry divisions of the field army in time of peace are the Hague, Arnhem, and Breda; they are commanded by Major-Generals.

Austria-Hungary.

The armed forces available are the following:—

	Officers and officials.	Other ranks.
Standing Army.....	32,420	1,015,792
Austrian Landwehr....	3,250	196,409
Hungarian Landwehr..	3,492	235,120

To these numbers have to be added, in war, the Landsturm, viz., 430 battalions, each of 1,000 men, and 20 squadrons, each of 150 mounted men.

They are distributed as follows:—

Austria:—92 marching battalions, of which 72 are formed into 9 brigades, and 20 do duty as staff and Etappen troops; there are, besides those, 142 territorial battalions.

Hungary:—94 marching battalions, of which 64 are formed into 8 brigades; 102 battalions provide for the duties of the interior; lastly, there are 20 squadrons of hussars.

Organization.—New regulations have been issued regarding the duties of the Inspector-General of Cavalry; the following are the most important features of them. The Inspector-General of Cavalry is an adviser to the Imperial Minister of War, whose instructions and intentions he has to carry out, and to whom he is directly responsible. He has to superintend the individual instruction and training for war of the cavalry, up to and including that of the cavalry brigades, and to satisfy himself of the efficiency for the field of cavalry regiments, as well as the proper condition for war of the entire equipment.

He inspects the above-mentioned cavalry units, and arranges his tours of inspection in such a manner that the whole of the regiments are inspected once in three years, not only with regard to detail, but also as to their military, tactical, and field training and employment.

Formation: Infantry.—The infantry has received an increase of its establishment in two directions. In the first place, each infantry company has been increased by 1 corporal, 2 lance-corporals, and 6 men, thus making it equal in strength to the field jäger company. Thus the peace strength of the company is to be 3 officers, 1 officer substitute, 1 sergeant-major, 2 subdivision leaders, 6 corporals, 6 lance-corporals, 70 privates, 1 pay officer, 1 drummer, 1 bugler, 3 officers' servants: total, 3 officers and 92 men.

This establishment has temporarily only been given to 25 regiments. The remaining 77 regiments will be raised to it in the course of the next two years.

The whole of the infantry regiments have received a further actual increase of 1,150 men, who had heretofore been borne on the strength of companies, but who were students in the cadet schools. These schools are no longer classed as belonging to the troops, and the vacancies are not in future to be kept open.

The Bosnia-Herzegovina Troops.—The increase in the native formations, determined upon two years ago, was carried out during the years 1891–92. They now number 12 infantry battalions, the first 8 of which have each 4 companies. The last 4 have 3 companies; a fourth company was to be raised for them in the spring of 1893.

Train.—New instructions have been issued regarding the disposal of the train belonging to an army in the field.

The train belonging to the troops, that is the transport attached to them to supply their immediate requirements, is divided into the fighting train and the baggage train. The train of the headquarters

and of the staffs of commands, also the army train, are not divided into these groups.

During marches, provided there is no danger of collision with an enemy, the fighting train of an infantry division are assembled by brigades, and follow their own brigades with the train of the brigade staff. The train of the division staff moves with that of the leading brigade.

The baggage train of all the troops in the column is united, and follows the rearmost portion of the fighting train.

Should a collision with an enemy appear possible or likely, the fighting train following the leading brigade, and which occupies nearly 1,960 paces, must clear the road for the rearmost brigade, and the whole fighting train of the division will be collected in rear of the ammunition park.

The fighting and baggage train of an infantry division combined occupy about 3,612 paces. When, therefore, more than one division march by one road in the vicinity of an enemy, the train of the whole army corps is to be united in rear of the troops.

The only transport remaining with the troops would be the ammunition train, the sanitary train, and portions of the supply train, which have to be kept with the divisions to ensure punctual issues being made.

These latter are restricted to the following sections:—

1st. One with the leading division, which gives up its provisions at the end of the march.

2nd. Two with the 2nd division; of these, at the end of the march, one moves up to the leading division, and accompanies it during the next march; the other section hands over its provisions to its own division.

3rd. Three with the rearmost division, of which, at the end of the march, two move on to replace those that were previously with the 2nd division; the third supplies its own division.

In the case of the troops having to be more closely massed, as in concentrating before a battle, even the supply train must be sent back, and remain with the baggage train 10 to 16 kilometers in rear. In this eventuality, both man and horse are provided with three days' reserve rations, and a reserve section with three days' reserve supplies is attached to each supply column, so that, if necessary, after the reserve provisions with the men and horses have been consumed, only one section per division need be moved up for the purpose of replacing them.

Mounted Orderlies with the Infantry.—On the occasion of the field exercises of bodies of the strength of regiments and upwards, four cavalry men were attached to each infantry regiment as mounted orderlies. They were quartered and rationed with the regiments concerned, and accompanied them at all exercises. They were employed on orderly duty, and to carry reports and orders; they were also utilized in reconnoitring under the battalion adjutant.

Roumania.

The peace strength is 2,960 officers, 46,000 men, and 10,000 horses, distributed into 4 army corps, having their headquarters at Crajova, Bucharest, Galatz, and Jassy.

In war, 4 field army corps are formed, composed as follows:—

2 infantry divisions of 2 brigades.

1 rifle battalion.

1 Kalarasch (territorial cavalry) brigade.

1 line cavalry regiment.

1 artillery brigade of 3 regiments (2 divisional and 1 corps artillery regiment).

1 engineer battalion.

1 train squadron and the necessary establishments.

There is a 5th Army Corps to be formed, which seems to be intended for garrison duties.

The strength of the mobilized army is 3,500 officers, 148,000 men, and from 15,000 to 17,000 horses. There are further available 50,000 trained men, the Militia and the Landsturm. No formations have as yet been created for the two last categories.

The amalgamation of the territorial cavalry with the cavalry of the line is in course of progress. During 1893, 4 of the territorial regiments are to be augmented to a strength of 4 complete squadrons and one cadre squadron.

The field artillery was increased in 1892 by 4 regiments of 6 batteries, so that it now consists of 12 regiments, each of 2 divisions of 3 batteries; total, 72 batteries. The 4 corps artillery regiments are composed each of 4 field and 2 horse batteries. Two new fortress artillery companies were raised during the same period.

In the event of mobilization, it is intended to create 33 battalions for Ersatz and garrison purposes, to be composed of the last two yearly classes of Reserve men.

A fourth cavalry regiment of the line is to be raised.

Russia.

New Formations: Infantry.—A new army corps (the XVIIIth, with staff-quarters in Dorpat) has been formed, from the 23rd Division (formerly in Reval) and the 24th Division (formerly Finland), and added to the St. Petersburg military district. On the other hand, 4 reserve cadre battalions, hitherto located in the St. Petersburg district, have been formed into a rifle brigade for Finland of 4 regiments, each of 2 battalions, to be formed from Russian soldiers, and to have the establishment of the 5 Russian army rifle brigades.

Four more Reserve infantry brigades, Nos. 45, 46, 47, 48, have been formed (3 of them from existing Reserve cadre battalions), each of 4 regiments of 2 battalions, so that there are now 7 of these Reserve brigades (in war, divisions). They are all located in the frontier military districts of Vilna (2), Warsaw (3), Kief (2). The establishment of Reserve cadre battalions, on the other hand, in

European Russia, has been reduced to 16 by the conversion of 4 into the Finland rifle brigade and 3 into Reserve infantry brigades.

In the Transcaspian, two Reserve cadre battalions have been formed from the existing local troops.

The fortress infantry battalions have been increased by 3, 1 each at Dunamund, Gradno, and Libau, so that there are now 31 of these battalions (including 1 regiment of 2 battalions),

In the Kuban Cossack territory, 2 new foot Cossack battalions of the 1st category, Nos. 5 and 6, have been added to the previously existing 4 battalions.

In the Caucasus military district, 2 of the previously existing Reserve battalions have been converted into Reserve regiments, each of 3 battalions. There were already 6 of these regiments, of which 2 are composed of natives. The 8 regiments now available will form 2 mixed Reserve brigades (in war, divisions), partly Russian and partly Caucasian. There still remain available in the Caucasus 10 battalions towards the creation of further new formations.

Cavalry.—The 15th Cavalry Division, staff-quarters at Plozk, formed in 1891, has consisted since of 2 dragoon regiments, Nos. 47 and 48, and the 3rd Ural Cossack regiment. It has now been made up to the normal establishment of 3 dragoon regiments and 1 Cossack regiment by the transfer to it of the Perejaslav dragoon regiment, No. 46, which belonged formerly to the Caucasus Cavalry Division.

To replace this regiment with the Caucasus Division, which, by its withdrawal, was reduced to 3 dragoon regiments, the Ossetin Cossack Division (a half regiment of 2 sotnias, but which could be increased at once to 4 or to 6 sotnias) has been definitely attached to the Caucasus Division. The 11th Cavalry Division (Dubno) has been increased by a Cossack regiment, No. 12 (hitherto in the Don territory); it numbers, therefore, 3 dragoon regiments and 2 Cossack regiments.

The Finland dragoon regiment (the only one in the principality) has been brought up to the normal establishment of six squadrons.

The six cavalry divisions located immediately on the western frontier, viz., the 2nd, 3rd, 11th, 12th, 15th, and the 2nd combined Cossack regiment have been placed in a position to take the field promptly (at latest on the third day after the declaration of war) by having attached to them a greater number of draught horses.

Cossacks.—The 1st levy of the Don Cossacks has been increased by 3 more independent sotnias, Nos. 31, 32, and 33. As the older classes are passed on in due course to the 2nd and 3rd levies, the total increase in war would be 9 sotnias.

In the Transcaspian territory, the Turcoman mounted militia has been formed into a Turcoman mounted division of the strength of a half-regiment. This is to form the nucleus of further similar formations, and will provide for internal duties, as do the analogous Caucasian militia in the Caucasus. It is placed under the orders of the Transcaspian-Caucasus Cossack brigade, which has now been permanently transferred to the Transcaspian command.

A Finland artillery regiment, consisting of 4 batteries, has been

formed. 2 of the batteries were taken from the 24th Artillery Brigade, which had previously 8 batteries, whereas the other brigades had only 6 batteries; 2 were newly created.

A siege artillery battalion has been raised at Kief. Three companies have been added to the fortress artillery at Sebastopol.

10 light batteries have been raised, 2 for each of the 5 European rifle brigades (each of 8 battalions). These batteries have, in peace, 4 horsed guns, in war, 8.

The Caucasian Rifle Brigade has had allotted to it the 5th and 6th mountain batteries of the 19th Artillery Brigade, which have formed in their place two light batteries. No steps have, as yet, been taken to provide the Guards Rifle Brigade, or the Finland rifle battalions, with artillery.

Looking to the independent *rôle* to be adopted by the rifle brigades or divisions in war, the attachment to them of artillery which has been made is a very important matter.

A 6th Reserve Artillery Brigade, having a similar establishment to that of the five previously existing, has been raised at Saratof. To effect this, the 7th batteries of Nos. 2, 4, and 5 Reserve Artillery Brigades were utilized, and 4 more light Reserve batteries, with 2 guns, only horsed in peace, are to be raised during 1893, and added to the 6th Brigade to complete it. The active and the Ersatz batteries, to be formed on mobilization from it, are to be kept as active light and Ersatz foot batteries, and not included in the brigade organization.

The Reserve Artillery Brigades to be formed in war are to consist only of 4 batteries of 8 guns, whereas the field artillery brigades have 6 batteries of 8 guns. But, in Russia, the conviction grows stronger that the organization in a brigade of 6 batteries, with 48 guns, is too unwieldy, and cannot be united under a single commander. Seemingly, therefore, the brigades now commanded by Major-Generals will be divided into 2 parts or regiments, composed of 4 batteries, each of 6 guns, commanded by Colonels under the Major-General, who would continue to command the whole brigade.

Engineers.—Two river mining companies have been raised. These companies are to be formed as required for the strategic water-ways, and are to be included in the engineer troops. In peace-time they are to make themselves familiar with all the conditions of the rivers to which they are allotted. In war they place the necessary mines and other obstacles, provide for the service of security on the rivers, and make the preparations for crossing them.

A fortress (harbour) torpedo company, having the same establishment as the Cronstadt company, has been formed at Vladivostok. There are, therefore, now, nine of these companies.

The Field Army.—For a war in Europe there would be available, of actual field troops, the Guard Corps (3 divisions), the Grenadier Corps (3 divisions), and 18 army corps of 2 divisions. Two more of these latter could be formed, the 19th and 20th, from field formations available for the purpose. These army corps are completely

provided with artillery (each division has a brigade of 6 batteries or 48 guns).

Their cavalry is not, however, complete, if only the divisions available in peace are to be reckoned, for with the 20 (or 22) army corps that would take the field, there would only be 19 cavalry divisions available for the European theatre of war, viz., 2 Guard, 15 army, and 2 Cossack divisions. These divisions, all except two, which have only one battery, have their full complement of horse artillery.

Formations not Organized in Army Corps.—In European Russia there are, in addition to the 4 Guard and 8 independent Finland rifle battalions, 24 rifle regiments of 2 battalions, formed in 6 brigades, 1 of which belonging to Finland. In the Guard only are the rifles comprised in the army corps. It is doubtful whether the rifle troops would, in war, be attached by battalions or by regiments to army corps, or be formed into greater bodies kept separate from the armies formed from the army corps for employment independently.

That such independent action is contemplated for the rifle brigades (which would, it is said, in war, be expanded into complete divisions) on a large scale, appears to be justified by these brigades having lately been furnished with the two light batteries. In this formation, which is favourable to independent action, they would accompany and support the cavalry divisions or corps which are called on to invade the enemy's territory, immediately war is declared, for the purpose of disturbing the mobilization, of undertaking raids, and especially for forming a screen to the masses of troops in their rear. This view of the probable nature of their employment is further supported by the fact that the rifle brigades, whose selected men are distinguished by their special qualifications as regards marching and shooting, and their efficiency in the minor operations of war, are, as is also the case with the cavalry divisions, mostly located close to the western frontier and provided with special train, which increases their mobility.

The remainder of the infantry form, for much the same purposes, the specially trained Achotniki, or volunteers. Already, in peace-time, they are frequently formed in regiments into separate independent companies, in the entire divisions into battalions, and in this formation employed in enterprises requiring courage and enterprise.

Reserve Troops.—Until the year 1889 these troops, which were formed after the war of 1877–78, consisted only of separate battalions, each of five companies, destined in war to form regiments of four battalions and a fifth battalion by the means of the Reserve men, to be formed into separate Reserve divisions or army corps. Taking into consideration the difficulties of mobilizing cadre troops of this nature, it has lately been decided to form, in peace-time, Reserve brigades out of a portion of the existing battalions. Each of these Reserve brigades consists of 4 regiments, provisionally of 2 battalions, which, on mobilization, are to be expanded into 4 battalions, so that complete divisions will replace the existing brigades; the staffs for

them are maintained in peace-time. Provisionally, the number of these brigades is 7, numbered consecutively after the previously existing 41 infantry divisions (exclusive of the 3 Guard and 4 Grenadier divisions), 42, 43, 44, 45, 46, 47, 48. There are still a large number of Reserve battalions—53 in Europe alone—available for the formation of further brigades, as means become available.

Originally the formation of 20 such brigades, or divisions, was contemplated, to be organized as separate army corps. It is now stated that in war, as already in peace, they are to be added as 3rd divisions to the existing army corps. The Reserve divisions are to be furnished with artillery from the existing Reserve artillery brigades (6, each of from 6 to 7 batteries), which are capable of great expansion. The divisional cavalry, also, for the actual field army is to be furnished from the 2nd and 3rd levies of the Cossack troops. This arrangement appears the more likely because the cavalry divisions—each of which has for its fourth regiment a Cossack regiment—would, at the commencement of hostilities, be formed into cavalry corps, which would have for their chief enterprise to overrun an enemy's territory.

The engineer troops in Russia, like the rifles and Reserve troops, are not included in the army corps organization in time of peace; they belong to the military districts, which are far larger than the army corps districts. Their allotment to corps in war is not definitely fixed in peace, and would depend on the object in view and the circumstances of the theatre of war.

Formation of Armies.—We arrive now at the grouping of the army corps and divisions in armies, with which the division of the Empire into military districts and the peace distribution of the troops have a certain relation. For a European war there are the military districts situated nearest to the western frontier, which comprise those of St. Petersburg, Vilna, Warsaw, Kief, and Odessa. Those of Moscow and Kasan are rather destined for the formation of Reserve armies, and that of the Caucasus forms, to a certain degree, a special theatre of war. The Asiatic territories may be left out of consideration.

Of the western districts, the three comprising Vilna, Warsaw, and Kief, which are situated in the centre, are of greater strategic importance. Consequently in these districts, and especially in the two last named, a sort of army organization, with the commanders and staffs detailed beforehand, is maintained in peace-time. Whereas in other districts the commanders have under their command all the troops located in them, it does not follow that in war they would have command in the armies formed from them. But in the military districts of Warsaw and Kief, and, in a more limited degree, in those of Vilna and Odessa, the superior commanders are designated as army commanders in war and have, with this object, at their disposal in peace-time the complete field staffs.

In the event of the army of operations being assembled and taking the field, a provisional superior commander is appointed to the military district, under whom are placed the Reserve, Ersatz and garrison troops that are left behind. These provisional commanders, in the cases of Warsaw and Kief at least, if not in the other districts, are

nominated in peace and act, as a rule, as assistants to the superior commanders. Generally the provisional staffs are included in peace in the district staffs.

In the General Government of Warsaw there are at present of field troops four complete army corps of two divisions with the normal proportion of artillery (48 guns per division of 16 battalions), each with one cavalry division. There are, further, two cavalry divisions not comprised in the army corps organization; also the 3rd Guard Infantry Division with a proportion of artillery and cavalry. Besides these there are two rifle brigades (in war, divisions) with artillery and, provisionally, three Reserve infantry brigades (in war, divisions).

As a Russian infantry division at war strength numbers about 15,000 men, there would be, providing the mobilization admitted of the rifle and reserve divisions being completed to war strength, 14 divisions, or a force of about 210,000 infantry. If, further, the 15 fortress infantry battalions located in the Warsaw district could be mobilized as designed, and expanded into a like number of regiments of war strength, the total number of infantry in the Warsaw district would amount to about 300,000 men.

To these have to be added the 6½ divisions of cavalry, or 156 (with the Kuban Cossacks 158) squadrons and sotnias which are maintained in peace at the war strength. These would be further increased, within eight days of the mobilization, by the 1st and 2nd levies of the Don Cossacks, and by the mounted frontier guards, the exact strength of which cannot be estimated.

For the artillery of this army there would, at a rough estimate, be 70 field batteries (560 guns, including the mortar regiment) and 12 horse batteries (72 guns).

It appears doubtful, however, whether the district could produce on mobilization the large number of men required to complete all the formations contemplated.

To meet this difficulty the troops are being gradually raised to a higher peace effective, so that fewer Reserve men may be required to complete them on mobilization.

Looking to these various possibilities, it would seem very rash to enunciate any definite conclusions with regard to the time necessary for completing the field army, or armies, or to their strength. In Russian military circles, however, it is thought that the armies of the frontier, and in particular the army of the Vistula, could commence operations, at the latest, within eight days of the order for mobilization being issued; but the cavalry could do so immediately.

The troops located in the districts of Vilna and Kief and destined to form the armies there have, with some immaterial exceptions, the same peace and war strengths as those in the Warsaw district. In the Vilna district there are 4 army corps (8 divisions), a division not included in the army organization, 1 rifle brigade, and 2 brigades (in war, divisions) of reserve troops; a third is about to be formed. On the whole, therefore, there are two infantry divisions, or 30,000 men, less than there are in the Warsaw district. It has also two cavalry divisions less, and less artillery in the same proportion.

In the Kief district there are 4 complete army corps with artillery, and 4 cavalry divisions, 1 rifle brigade, 2 Reserve brigades, and 4 Reserve battalions which can be formed into a division in war. The addition of 1 infantry division is further to be made to this district. There are, then, altogether somewhat more troops than there are in the Vilna district, and somewhat less, chiefly of cavalry, than in the Warsaw district.

The troops of the Odessa district, destined in part to co-operate with the Kief army and in part to serve as its Reserve, are only about half the strength of the troops in the other three districts. They consist of 2 army corps with 2 cavalry divisions, 1 rifle brigade, and 8 Reserve battalions that are available to form two Reserve divisions. But it would be necessary for them to provide for watching the Danube territories and Turkey; a portion of the troops, therefore, would not at first be available for offensive operations.

The most northern of the Russian military districts (Finland) has only a secondary importance, for the permanent national armed forces there are small, and destined more for defensive than for offensive purposes, whereas the Russian garrisons in the principality would have, in the event of war, to be strengthened rather than reduced.

The troops of the St. Petersburg military district are more capable of employment, and they would serve rather as reserves. They are the Guard Corps (2 divisions; for the third, see Warsaw), the 1st and 18th Army Corps, 1 rifle brigade, and 5 Reserve battalions. In cavalry the Guard Corps is especially strong (after deducting the permanent Warsaw brigade, and including 4 sotnias of the Imperial escort, from 57 to 60 squadrons and sotnias), so that it could detach cavalry to other army corps requiring it. This would be the more necessary because the 18th Corps in the same district has provisionally no cavalry division belonging to it, and the 1st Army Corps cavalry division is located in the Moscow district. Whether the troops disposable in the St. Petersburg district after provision has been made for the garrison of the capital, for the coast defence, &c., would reinforce the armies of operations (Vilna and Warsaw), or form the nucleus of a reserve army, would depend upon the plan of operations and the situation.

The same may be said with regard to the disposition of the troops in the Moscow and Kasan districts. In the Moscow district are the Grenadier corps (3 divisions), the 13th and the 17th Army Corps; but only one cavalry division (belonging really to the 1st Corps). These three army corps serve rather as a central reserve, to which the Reserve divisions to be formed from the 16 Reserve battalions would be added. The necessary cavalry for them would be drawn principally from the 2nd levy of the Cossacks. There are, further, located in the Moscow district nearly all the Ersatz cadres for the regular cavalry, and the marching squadrons for regiments in the field would be despatched to them from there.

In the district of Kasan, the one furthest removed from the European theatre, there are now only 16 Reserve battalions; the 40th Division, previously located there, has been moved further west, and for

cavalry it has only one regiment of Astrakan Cossacks. Quite lately the progress towards the west has been extended to the troops of the Moscow district.

The 13th Army Corps, which had its staff quarters previously at Moscow (one division at Moscow, the other at Orel), has been moved to Smolensk, with one division at that place, which is situated on the extreme western limit of the district; two grenadier regiments, previously at Tula and Kaluga, have been moved to Moscow in its place. By this pushing forward of the 13th Army Corps along the main Moscow-Warsaw railway, the distance of these troops from the western frontier has been reduced by one-half. In the same way the staff of the 17th Army Corps has been moved from Nishni Novgorod to Tula, with the 3rd Division at Kaluga, and the 35th Division at Rjäsan.

All these movements of troops, which are not yet concluded, indicate clearly the intention of only maintaining sufficient field troops in the easterly provinces of the Empire to meet the absolutely necessary requirements, while the bulk of them are brought nearer to the western frontier. In their place the Reserve troops are being more and more developed, and for defensive purposes there is, further, the Opoltschenie, which alone numbers over two millions, and is no longer a purely paper force.

Numbers Available for a European War.

For a war on the western frontier the following can be mobilized for employment in the first line:—

Infantry:—

44 infantry divisions (4 in the Caucasus not included), at 15,000 men per division	660,000	men.
6 rifle brigades (divisions including Finland, excluding Caucasus)	90,000	„
4 Guard rifle battalions.....	3,800	„
About 10 Reserve brigades (divisions)	150,000	„
	903,800	„

This average number could be increased to over one million men by the mobilization of 10 more reserve brigades.

Cavalry:—

19 divisions (exclusive of the Caucasus, the escort and minor formations) with 467 squadrons and sotnias, comprising 67,000 sabres.

By calling in the 40 and more sotnias of the mounted frontier guard, besides the Cossacks of the 2nd and 3rd levies, at least 40 to 50 more regiments of 6 sotnias could be formed, by which the number of sabres could be increased to 100,000 and more.

Field Artillery :—			
44 brigades (not including the Caucasus)	264 batteries,	2,112	guns.
10 reserve brigades (at least)	40 „	320	„
14 rifle batteries (including Finland)	14 „	112	„
3 mortar regiments	12 „	72	„
6 mountain batteries (regiment)	6 „	48	„
	336 „	2,664	„
By forming 10 more reserve brigades, 40 batteries or thereabouts, or could be obtained, besides 5 sortie batteries and batteries of the artillery practice school.		320	„
Total, about		3,000	„
Horse Artillery :—			
6 Guard batteries (brigade) and 34 army batteries (including Cossacks)		240	guns.
15 to 20 Cossack batteries of 6 guns		120	„
Total		360	„

Engineer Troops.—4 railway, 15 sapper, and 8 pontoon battalions, 15 telegraph parks, &c.

Fortress Troops.—Infantry (only on the west frontier) about 22 battalions (in war, regiments), 100 battalions; artillery (west frontier), about 30 battalions; engineers, about 8 companies, balloon detachments, &c.

Training of Reserve.—In 1892, the Reserve men of the following classes located in European Russia and the Caucasus :—

1st. The 1887 yearly class who had served less than three years with the active troops.

2nd. The whole of the Reservists of the 1882 class.

The duration of the exercises for the Reserve men of both years who belonged to the field and fortress artillery, and for those infantrymen of the 1882 class who had served less than three years with the colours, was 21 days; for all other infantry Reserve men it was 14 days. The cavalry, horse artillery, and engineers are not called out.

Training of the Opoltschenie.—This was carried out under new instructions, which do not, however, differ materially from the regulations of 1890, previously in force. There are two periods of training, each lasting 21 working days; but there is an interval of two years between them.

At the conclusion of the first period the ratniki, as the men are called, should be proficient in company drill, and able to take their part in the shooting line with blank cartridge. Only six rounds of ball cartridge are fired at the end of the first period, three at 100 paces and three at 200.

Switzerland.

The armed forces consist of three categories: the first of these, which forms the field army, is composed of about 128,500 men, forming 104 battalions, 24 squadrons, 10 companies of guides, 48 field batteries, 2 mountain batteries, 10 companies of artillery of position, 16 park columns, 8 engineer battalions, 8 field hospitals, and 8 administration companies.

After having been trained as recruits, these troops are only called up once in every two years (the cavalry every year) for from 10 to 18 days' exercise.

The 2nd category is the Landwehr, which numbers 81,000 men, and forms a similar number of units of infantry and cavalry to those of the 1st category, but the infantry battalions are of reduced strength. Of artillery, there are 8 field batteries, 2 mountain batteries, and 14 companies of artillery of position; there are also 8 park columns, 8 engineer battalions, 16 ambulances, 8 hospital sections, and 8 administrative companies. The Landwehr men, after having performed their military drills, are called up every four years for a period of five to six days.

The Landsturm numbers 265,000 of all ranks, but of these, 82,000 only are armed, and they have not hitherto been called up for any periodical exercise.

Organization.—The most important changes are those connected with the further development of the army corps formation, and with the Landwehr. The army corps commanders, their Chief of the Staff, and the rest of the personnel of the army corps Staff, have been nominated, and on mobilization the existing 8 army divisions would form 4 army corps.

As regards the Landsturm, they were, during 1892, armed with the magazine rifle, and furnished with equipment and 30 rounds of ammunition. A proposal has also been put forward to legalize the men being called out from time to time for drill.

Servia.

The standing army varied in strength during 1892 between 9,000 and 18,000 men. The country is divided into 5 divisions, to each of which there is allotted 1 infantry regiment of 4 battalions (1 Guard), and 1 regiment of field artillery of 6 batteries. The 3rd or Danube Division has also 1 regiment of cavalry and 1 horse artillery battery The 4th and 5th also have each a cavalry regiment.

These peace formations are on mobilization utilized for the completion in each district of 1 infantry division of 3 regiments comprising 52 companies, 2 squadrons of cavalry, and 1 regiment of field artillery of 8 batteries; each division has also 1 company of engineers and 1 company of sanitary troops.

Apart from, and in addition to, these divisions, there is a brigade of cavalry of 3 regiments, with 1 horse battery; a regiment of mountain artillery of 9 batteries, each of 4 guns; a battalion of fortress

artillery of 4 companies; a battalion of engineers of 7 companies; and a company of sanitary troops.

In addition to these troops, which form the field army, there are the national levies. Of these, the 1st levy is divided equally into 5 divisions of 3 regiments each of 4 battalions of 4 companies, 2 squadrons of cavalry, and 4 batteries of 6 guns.

The 2nd levy provides in each of the five divisional districts for 3 infantry regiments of 4 battalions of 4 companies, 1 squadron of cavalry, and 1 company of artillery. No provision is made for the amalgamation of the 2nd levy formations into larger bodies.

Strength—

	Officers.	Men.	Horses.	Oxen.	Guns.	Wagons.
Field army.....	2,474	202,233	26,486	15,052	282	9,281
1st levy.....	1,720	77,005	12,305	6,910	120	4,165
2nd levy.....	1,506	60,712	6,309	?	—	554
Total ..	5,700	239,950	45,100	?	402	14,000

TURKEY.

The army consists in peace of 7 corps and 3 independent divisions. Each corps is composed as follows:—

2 infantry divisions each of 1 rifle battalion, and 2 infantry brigades of 2 regiments, each of 4 battalions; 1 cavalry division of 3 brigades, each of 2 regiments of 5 squadrons; 3 artillery brigades of 2 regiments of 2 divisions of 3 batteries; and 1 horse artillery division, which is attached to one of the 6 regiments; 1 engineer battalion; 3 train squadrons.

The total peace strength is, in round numbers, 230,000 men, but of these there are scarcely 180,000 combatants.

In war, 4 army corps are to be completed from each of the 6 recruiting districts, viz.:—

1 field army corps.

2 Redif army corps (equivalent to Landwehr).

1 Mustahfiz army corps (equivalent to Landsturm).

The corps are all composed as in peace-time.

Strength.—The number of line battalions is 287, and of Redif battalions 354; together 641. If the strength of battalions be reckoned at 800 men, the total infantry would amount to about 512,800 men. By adding to this number the auxiliary services, the cavalry, Militia, the Ersatz battalions, the Landsturm battalions, the Volunteers and irregular troops, the total in round numbers might be 800,000 men. But no arrangements whatever have been made for forming the Landsturm into battalions, and no material is available for constituting the cadres.

In reality, therefore, the organization laid down could not be com-

pleted on mobilization, and it is probable that no more than 1 field and 2 Landwehr army corps could be formed in each of the first five districts; in the sixth, only 1 of each kind could be reckoned upon. At the most, therefore, only 17 army corps would be forthcoming, of which at least 3 would have to be employed on the frontiers of those States the neutrality of which could not be depended on. It is estimated that after 8 to 12 weeks from the first day of mobilization, at the most 13 to 14 army corps of about 400,000 men would be available to begin a campaign.

Territorial Distribution.—For the purposes of recruitment, the country is divided into six corps districts, viz. :—1st, Constantinople; 2nd, Adrianople; 3rd, Monastir; 4th, Erzeroum; 5th, Damascus; and 6th, Bagdad. The 7th corps in Yemen, and the independent divisions of Hedscha, Crete, and Tripoli have no separate territorial districts. Each corps district is subdivided into 8 Landwehr brigade districts, each containing 2 regimental districts, each of 4 battalion districts, which are again divided into 4 company districts.

Infantry Tactics.

Normal Fighting Formations.—The literary combat regarding the admissibility or the necessity for exact rules for the attack still rages. The struggle has not hitherto led to any result, for one reason, because agreement is not possible between views that are different in principle, and also because the provision inseparable from a discussion the object of which is known was wanting, viz., that the conditions should be laid down under which alone there could be a question of the normal attack. The normal attack, or rather the normal procedure—for it applies both to the attack and the defence—is, in its application, not dependent on the ground, so that it might be said to be applicable to this or that ground, but is entirely dependent upon the tactical situation. There can only be a question of a normal procedure when this situation is governed by conditions of a similar nature, for this procedure is fixed beforehand for a definite situation, and is then to be employed. Fortress warfare, for example, produces conditions that can be reckoned with beforehand; consequently, in almost all European armies, a normal procedure has been adopted for it In field operations the conditions of fighting of large bodies seeking a decision alone offer some similarity, and can to a certain degree be foreseen, even before the fight is entered upon. It thus becomes possible in such a case to adopt a normal procedure.

This normal procedure extends only to the rules for the forming up, the deployment, the distribution in breadth and depth, as well as to those for the co-operation of the infantry with the artillery, but can only contain an indication as to the probable course of the action. It must be evolved from a knowledge of the nature of a fight, as it will be with the latest means available for carrying on war, and must be so elastic that it can be easily adapted to any ground, and to the special measures adopted by the enemy.

The following information, extracted from a paper in No. 57 of

the "Militär-Wochenblatt," for 1892, contains a comparison between what may be regarded as a normal procedure as contained in the regulations of the four most powerful European States:—

The Attack.—All four regulations divide the attack into three parts. The first part is the advance towards the enemy's position up to the time fire is opened. All four regulations prescribe only weak advanced troops for the first deployment. The shooters advance, without stopping, as rapidly as possible towards the enemy's position. The Russian and Austrian regulations fix 2,000 paces for the commencement of the deployment, the German regulations do not fix a distance, and the French ones prescribe the first deployment of a firing line to be when this is necessitated by the enemy's fire. As regards the distance from the enemy at which it is hoped to arrive without stopping, the German regulations do not lay down any fixed distance, the French indicate 700 m., the Russian 800 paces, and the Austrian 1,000 paces.

The second part comprises the carrying out of the fire engagement, obtaining a superiority of fire and advancing up to the assault. The German regulations provide for swarms of shooters acting on the enemy in order to gain the superiority of fire; no fixed distance is laid down for pushing up the supports into the firing line. The Russian regulations prescribe an advance by rushes either of the entire firing line, or of portions of it up to within from 300 to 150 paces; it is assumed that at the commencement of the movement of attack, that is, at 800 paces, the supports will have already moved into the firing line. The Austrian regulations provide for the advance of entire companies by rushes up to 500 paces from the enemy; no distance is laid down for the supports to be moved up. The French regulations also prescribe an advance by rushes, by companies, or by successive portions up to 250 m. from the enemy; they contain a caution against the mixing up of units and assume that the supports will be completely incorporated in the firing line at 400 m. from the enemy. All four regulations direct that the enemy shall be completely crushed by fire before the assault is undertaken.

The third part is the actual assault. The German regulations do not give any distance at which it is to begin; they assume that the reserves will have approached near to the firing line. The assault itself is carried out either by order of the superior commander, or else on the initiative of the firing line. In essential points they are similar to the Austrian regulations, only that these fix 500 paces as the distance at which the assault should commence. The Russians fix it at from 300 to 150 paces, the French at from 250 to 200 m.

After the assault has been successfully carried out, all four regulations prescribe that the enemy should be followed with fire. The French regulations direct that in the event of failure the assault is to be repeated.

The Defence.—All four regulations lay down, as the main principle in the defence, the utilization of fire effect and the appropriate employment of the ground.

The German regulations are based on the directions contained in the musketry regulations. The Austrians only desire the fire action to be entered on generally at short or moderate ranges; at long ranges it is only to be resorted to when the target is large and there is plenty of ammunition available. The French would open fire as soon as the enemy can be hit; the Russians prefer to develop their fire gradually. Everywhere, except in Germany, volleys are recommended.

As regards the choice of a position and the preparations for improving its capability of defence, all four regulations are agreed as to the main points. These are the division of the position into sections, diminution of the intervals in depth, the holding in readiness of section reserves in covered situations, the sufficiently strong occupation of the position as soon as the direction of the attack is recognised, the separation of a general reserve, if possible behind a flank. The German regulations dwell on the advantage of moving this general reserve to a flank and forbid its being retained for the purpose of covering the retreat; it should rather be employed with a view to its producing some distinct result.

The German and the Austrian regulations favour the offensive only when a successful issue is contemplated, the French prescribe a counter-offensive in all circumstances, the Russians only when the enemy is too much shaken to be able to carry out the assault.

Influence of Smokeless Powder.—A more quiet and on this account a more harmonious apprehension of this subject now prevails. It is to the effect that the employment of smokeless powder will not have so great an effect in transforming the aspect of a fight as it had the appearance of doing at first.

The increased effect of infantry fire due to the absence of smoke will benefit equally the attack and the defence; it consequently will not lead to a material transformation of the fighting tactics of infantry. But the value of a careful training of the infantry in shooting, adapted to war, will assume still greater prominence than in the past.

Influence of Small-Calibre Rifles.—The characteristics of this arm are that by it the range, flatness of trajectory, accuracy, and penetration of the bullet are materially increased. All these properties are of more use to the defenders than to the attackers, for the latter in moving forward offer a more favourable object to the enemy than do the enemy to them.

The defender will strive to occupy or to make suitable cover, which he will generally be in a position to do; the attacker will be forced to begin the introductory fire sooner, that is, at longer ranges, than heretofore, and his nearest supports will have, where the ground does not afford cover, to be kept further back than usual.

It will further be necessary to push the infantry detailed for the protection of artillery further forward, to from 700 to 1,000 m. in front of the artillery position. The great power of penetration possessed by the small-bore bullet seems to justify the theoretical requirement that only formations of the shallowest depth (in one

rank) should be employed within effective distance. But against this is the consideration that such formations are very unhandy, they do not allow advantages of ground to be utilized, and are bad for fire discipline. But in any case the question is not yet ripe for decision, and none of the great military Powers have as yet declared themselves officially on the matter.

Infantry Tactics in the several Armies.

Germany.—The conviction gains ground more and more in Germany that more must be done than hitherto as regards the training of infantry to fight in masses, for the battle in fact.

It is high time; for there can scarcely be a doubt that the engagement of masses of troops with a view of obtaining a decisive result is the most important operation in war; it decides the fate of a campaign, and also has its specific phenomena with which acquaintance should be made in peace-time. It is not necessary for this purpose that large bodies of troops should be assembled for exercise. A single regiment, or, indeed, even a battalion and a company, can perform exercises as in battle, provided they maintain the necessary frontage, and that the officers who conduct the exercise take the action of the artillery into consideration with a proper appreciation of the tactics of that arm.

If exercises of this nature were to be frequently carried out, very soon a normal procedure would be evolved from them, and the time would have arrived for laying it down in the regulations.

France.—Here also interest in battle tactics is paramount. Colonel de Ponchalon has published an important book on the subject ("Nouvelle Tactique de Combat," Paris, 1892). He advocates the infantry of the advanced guard annoying the hostile artillery by volleys at long ranges: the more detailed reconnaissance of the enemy's position would be effected by cavalry and infantry patrols. He recommends thick firing lines, the men shoulder to shoulder; the mixing up of different companies is, as far as possible, to be avoided. The supports to advance in rank entire, the firing line to push forward as rapidly as practicable, and, if possible, without halting, to within 600 m. of the enemy. At this distance only should the fire attack of the shooting line commence and the actual attack be developed. The reinforcements then coming up should always carry forward with them the firing line; but this is regarded by the author as very difficult of execution, for if the firing line be made too thick unnecessary losses will result.

Firing at long distances has lost much of its prestige in the French army. It is no longer to be employed on the offensive, with this sole exception, in the form of volleys against hostile artillery. On the defensive, volleys are only allowed to be employed up to a distance of 1,200 m.; volley firing at greater distances is regarded as a waste of ammunition. More is expected from the fire of individual good shots.

Cavalry Tactics.

1870–71 produced on the German side the beginning of widely extended reconnaissance with cavalry masses in front of the army. The course then adopted has been since followed by all the Great Powers; war will show cavalry divisions combating in advance; the victors will endeavour to reconnoitre and damage the enemy in flank and rear. Only a small portion—divisional or corps cavalry—will co-operate in close combination with the other arms for the purpose of gaining intelligence; they will watch for favourable moments during the battle, and above all will be quickly at hand to undertake the pursuit.

So far all opinions seem to be in agreement; the objects of cavalry action are to a certain degree fixed, but over the means and ways of execution there is little unanimity. On the one hand are those who see salvation only in raising to the highest standard the training of man and horse, who are afraid of their equestrian performances being injuriously affected by attention to auxiliary duties, and who desire only a one-sided training. Drill discipline on the part of the troops, skill in drilling on the part of the leaders in many forms, handling the sword, the most thorough instruction in single combat mounted, exercises of every sort with the lance take the first place. On the other hand, shooting and dismounted action, patrol and field duties, pontoon and telegraph services are regarded by this school as of inferior importance.

The representatives of another view would make the men fit to do anything. By simplifying the instruction in riding, in every possible way, they would save time for other branches of instruction. The riding-master element would disappear from the instruction in equitation, the difficult formations from the drill regulations. The cavalry would endeavour to replace what it has lost in fighting power as compared with the other arms by mobility and many-sidedness.

In the 1890 and 1891 Reports, the first of these parties expressed themselves sufficiently. The writer of this present Report has therefore no hesitation in expressing an opinion in the contrary sense, and he believes he can foresee from the cavalry "signs of the times" that his views will prevail more and more, and must find confirmation in the next war. The simplification of instructional regulations and formations seems possible without the least injury being caused to equitation.

Cavalry Tactics in the several Armies.

Germany.

The German cavalry has endeavoured since 1870 to benefit by the experiences of the great war. The great advantage of keeping closed divisions secure in the hand of their leaders was recognised. Besides raising the internal value of the arm, the leading of large masses was consequently kept in view, and yearly a number of cavalry divisions were brought together for separate exercises;

divisions even were formed as a permanent peace organization on the east and west frontiers respectively of the Empire.

From this resulted a system of tactics peculiar to the extensive cavalry exercising grounds. A few gifted Generals mastered it, and to them, as admittedly the best instructors, these exercises were entrusted time after time, and they endeavoured to improve their art and its forms. Half-column, introduced in 1870, to allow of riding diagonally, and so to be able to deploy by a shorter way than was entailed by the two rectangular wheels previously necessary, was admirably adapted for the increase and embellishment of the evolutions; the distribution in lines offered the opportunity of most elegant exercises—to the few who commanded them.

The preference was naturally given to extensive level plains and, as the exercises were held within the limits of these areas, the action of masses in battle, normal attack formations against cavalry, infantry, and artillery were almost exclusively practised.

The dangers of this system of teaching having been recognised, the two frontier divisions have since been broken up, and attention has been directed to the question of how the cavalry can be freed from the fetters of form, which was effected for the infantry and the artillery by the 1888 regulations. It was settled that, next to rapidity, mobility is the most important characteristic of a good cavalry. This cannot be attained by practising a quantity of different evolutions, but only by an understanding between the leader and his command which shall be proof against fire and dust, and, further, by training all the subordinate leaders to freedom and independence in taking decisions.

From the combination of rapidity and mobility in movement results the attack by surprise, which offers the best means of success in the cavalry fight. The imparting of orders with the least possible noise is necessary to effect this more surely.

In riding to the attack it has been recognised as of great importance that up to immediately before impact the troops should continue to be in hand. In order to be able to change direction and make use of the ground, the moment for forming into line should be chosen as late as practicable. Breaking the front and flank movements in proximity to the enemy expose the troops to the danger of being themselves taken in flank. Before the enemy, therefore, wheels on a fixed pivot are to be avoided; they always require more signals or commands, and cramp the course of the movement. The change of direction by the leading unit suffices for all changes of direction and changes of formation that are not carried out at the halt and on a fixed alignment. Half columns and échelon formations can be altogether dispensed with before the enemy, and should be removed from the regulations.

For attack against infantry, fixed rules have been more and more dropped. The situation, position, formation, moral condition, and expenditure of ammunition on the part of the enemy will influence the form of attack as much as will the nature of the country, the ground, and the weather. Line, column, or swarm can each be

justified according to the circumstances. Formations which render it more difficult for the enemy to direct their fire, and which will scatter it, that is, the formation which will present many small targets in the greatest number of directions possible, will the most easily avoid great losses in approaching. But the choice of the proper moment for attack on infantry is of far greater importance than is the formation. The dissolution of all close connection, the mixing up of units in long thin lines, the difficulty of compact leading in the fight and in control of fire, the using up of the last reserves, the rapid expenditure of ammunition—all these characteristics of a modern infantry engagement mark the moment when an exhausted infantry may still exceptionally fall a prey to a skilful and determined cavalry attack. The attack of cavalry against infantry that is unshaken, or that is covered by difficult ground, offers no prospect of success, and in the most favourable instances is not worth the loss entailed. During a battle, the commander must always keep before him what important services will be demanded from the cavalry after the tactical decision during the further course of the campaign, and how difficult it will be to fill the gaps that might be caused in a few minutes in their ranks.

Dismounted Action.—The dismounted action of our cavalry, notwithstanding that it is armed with an excellent repeater, has still only reached a standard that is far from high. It is not the shooting, the results of which are on an average good; but there appears to be a general want of perception of the proper formations to be employed, as also of the place and time for their employment. The necessary appreciation of the value of this duty of the cavalry soldier is also frequently wanting. On the other hand, the view that this kind of fighting is of importance is constantly gaining ground from year to year, and at the same time the conviction that instructions for its conduct should not, as hitherto, be based upon infantry principles, but on those applicable to the cavalry arm.

Employment of Horse Artillery.—Its action on the cavalry exercise grounds in close combination with the attacking regiments has come to be recognised more and more as a parade manœuvre, not based in any way upon the experience of war, The new Regulations for the Field Artillery, of the 27th June, 1892, give expression to this, when they prescribe "a position secure from direct attack" for the attached horse artillery batteries in an engagement of cavalry with cavalry. As such positions are seldom to be found on the fields of action suited to cavalry masses, the horse artillery will generally have to limit its action to supporting the deployment of its own regiments, and to inflicting damage on the enemy from long distances; it must refrain from forward action with the attack.

During the reconnoitring of the cavalry divisions, the batteries will find their most important employment in strengthening their powers of resistance in occupied villages or defiles, or in breaking down those of the enemy in similar situations and forcing him to show his strength. In such cases they may look for especially good results when operating in combination with dismounted cavalry.

The horse artillery will also be in a position to exercise an effective action against large bodies of mixed arms, whether on the march or halted. An especially important *rôle* falls to it on the occasion of the cavalry retreating or pursuing.

In the first case, its strong fire power, combined with its mobility, allows of its holding out until the last. In pursuit, taking up a flank position, it forces the fleeing column to stop, clear the roads, and form front against an enemy who, while constantly annoying it, will avoid any counter-offensive movements.

Here, again, the cavalry may resort with advantage to dismounted action. Thus the leader of a cavalry division has, on a small scale, the opportunity of employing the three arms in combination.

Cavalry Manœuvres.—The year 1890 inaugurated, at the close of brief cavalry drills with the IVth, XIth, XVth, and XVIth Army Corps, the first extensive strategical reconnoitring exercises. The divisions, at a distance apart of 120 km., were launched against one another from points that had been kept, as far as possible, secret. Shelter was obtained according to the course of the manœuvre, and supply was conducted as much as possible under service conditions. In 1891, similar exercises were conducted in two groups. In 1892 they fell through, owing to the cholera.

Apart altogether from the instruction gained by the troops and their leaders in these manœuvres, their value may be seen in the fact that they turned the attention and thoughts of the entire German cavalry from the pictures of the exercise ground to the consideration of war conditions. The most important of all the principles of modern cavalry, by which their right of existence must stand or fall, was for the first time brought clearly to light. It is, that the successful attack, though generally a condition, is not the final object, of their action, and that the most important services remain to be performed on the far side of the battle-field.

The same manœuvres led to the conviction that the cavalry of to-day, in order to be able to move freely and independently, must have a more varied equipment and training than hitherto. The most frequent obstacle is to be found in water-courses. More emphasis was consequently laid upon the instruction of the cavalry in bridging and swimming, which formed already a branch of their duties.

Two linen boats, of English pattern, were furnished to each cavalry regiment. Each holds from six to eight men, fully equipped, and the horses swim with them. They are in three parts, and are carried, with all their appurtenances, on a four-horsed wagon which forms part of the small baggage of the regiment.

As regards bridging, which in cold weather is the preferable method of crossing, each regiment now carries a certain proportion of material for the construction of bridges. A bridge 3 m. wide, to carry cavalry dismounted by twos, with intervals of a horse's length, or field guns and wagons drawn by one pair of horses, can be rapidly placed from the material with 1 regiment to a length of 12 m., from that of 2 regiments 20 m., 3 regiments 28 m., 4 regiments 36 m., 5 regiments 44 m., 6 regiments in round numbers 50 m. These

lengths are about doubled if the breadth of the bridge be reduced to 1 m., when each boat furnishes two pontoons.

Alterations in the "Felddienstordnung."—One or two short but important changes have been made in the parts referring to cavalry. Under "Advanced Guard" (1, 72) the sentence ran originally: "So soon as close touch has been gained with the enemy, the tactical employment of the cavalry comes into prominence; even then, however, the reconnoitring must not be interrupted." In place of this, the following has now been substituted: "Even after close touch with the enemy has been gained, reconnoitring continues to be the principal duty of the divisional cavalry. Its tactical employment is not excluded if a favourable opportunity offers itself. The necessity for providing fighting infantry with cavalry for reconnoitring in sufficient strength must be taken into consideration in detailing independent cavalry." Further (1, 77), under "Rear Guard," the following has been newly added: "The distribution of the cavalry is to be so proportioned that they can effect the screening duties in the vicinity of the roads marched on, and that it may not be necessary to employ infantry patrols for the purpose."

France.

There has for long past been a sustained paper discussion between the advocates of the so-called "tactique de masses" and the "tactique de dissémination." The latter view has brought about the permanent organization in peace of corps cavalry brigades and cavalry divisions.

The "Revue de Cavalerie," which advocates the contrary view, regards this division as a great mistake, and wants uniformity in arms, equipment, and training, and the formation of all the regiments into cavalry divisions. Within these the services provided for hitherto by the corps cavalry brigade, that is, reconnoitring, security, orderlies, and reporting duties, would be diligently practised.

Russia.

Ssuchotin's mass firing from horseback, in which he recognised "a new and powerful arm for the cavalry of the future," has been almost universally rejected; but the firing of individuals or of small parties mounted, so as to avoid loss of time dismounting, is held by many to be applicable.

General Gourko, on the other hand, has forbidden in orders most strongly any firing from horseback. In place of the craze for shooting, there is now a reaction in the direction of the opposite extreme.

The Russian cavalry is taught to believe (Dragomirov) that it can ride down everything. Surprises by night of mounted cavalry upon cavalry in bivouac are frequent, and are met not with the carbine, but by mounted attack. Even attacks of mounted cavalry are made on infantry bivouacs, and are declared to have succeeded. Certainly these refer only to camps of exercise at which the cavalry is

acquainted with every inch of ground. The successes achieved by the dearly loved night exercises in Russia are founded almost entirely on the experiences of these camps.

The same principle of inconsiderate wild charging against the other arms is carried out in the great manœuvres with mixed arms. Umpires and conferences at the close of the operations unite in encouraging this kind of offensive spirit in every possible way, and in according success where, from the German point of view, defeat, if not annihilation, would have resulted.

Tactics of the Field Artillery.

Smokeless Powder.—The discussions on the subject of its influence on field artillery tactics which have prevailed for some years have given place to certain recognised principles, the result of four years' experience on the exercise ground, and they have now been embodied in the several books of regulations and instructions.

Corps Artillery.—The question of breaking up the corps artillery and distributing it amongst the divisions has not advanced. But France, in the autumn manœuvres of 1892, formed the 11th and 12th Corps in three divisions instead of two, and it was shown that without doubt there were advantages in this distribution on the battlefield. With such a distribution, the last reason for retaining the corps artillery disappears.

The question of how the infantry attack upon intrenched positions can be effectively prepared by artillery fire has not yet arrived in all armies at a final solution.

Colonel Langlois, in a book he has published, solves it in the simplest manner by denying altogether the necessity for preparation by artillery. He says that the duties of artillery in the attack on intrenched positions are as follows: 1st, to drive the garrison from the parapet; 2nd, to prevent the reinforcement of the firing line; 3rd, to repulse counter-attacks. As all these ends may be attained by the use of shrapnel, he would have nothing to do with high-explosive shells or field howitzers.

That the French military authorities are not altogether of this opinion is evidenced by the fact that experiments have been made with a 12-cm. field howitzer.

In Germany, heavy batteries of foot artillery have taken part in manœuvres of mixed arms, and special teams of horses of a strong type are available for these batteries. The means at the disposal of field artillery undoubtedly suffice only for the effective bombardment of troops in slight intrenchments without enclosed cover. But they are not sufficient to break down even slight covered shelter such as can be constructed with small means and little expenditure of time.

Still less can the high-explosive shells of the field artillery make an impression on excavated cover of the slightest kind. Heavy projectiles with a highly curved trajectory are required for this purpose, and therefore mortars and howitzers. The attack on such

positions, the arrangements for which always require a certain time, cannot be determined in 24 hours; it will necessitate careful investigation and thorough preparation. Time will consequently be available in which to bring up the heavy batteries that will be following at a long distance in rear of the army.

Quick-firing Guns for Field Artillery.—The question is one rather affecting material than tactics. The widely-spread enthusiasm for small-bore quick-firing guns is essentially the consequence of the false saying that a gun is no more than an enlarged rifle. As such great advantages have been gained for this arm by diminishing the calibre and increasing the rapidity of fire, it is thought that the same must be the case with the gun. It is forgotten that with the rifle the diminishing of the calibre and the weight of the projectile not only allows of an increase in the rapidity of the fire, but at the same time improves the arm in every respect; the trajectory is flattened, the accuracy improved, and the penetration of the bullet increased. The decreased weight of the ammunition for the small-bore rifle has a higher value than a similar weight of ammunition of a rifle of larger calibre. With 1 kilo. of cartridges M/88 at least double the effect will be produced, the conditions being similar, as compared with 1 kilo. of cartridges M/71. Exactly the contrary is the case with the gun; with the decrease in the weight of the projectile the effect is less.

Germany.—The number of ammunition wagons has been increased by one per battery, and the high-explosive shells which were previously distributed equally between the wagons are in future to be carried in two separate ones. To meet this, one store wagon per battery has been dispensed with, and, on the other hand, a forage wagon has been added to each field battery; previously only horse batteries had them. The battery material therefore now consists of 6 guns, 9 ammunition wagons (including 2 for high-explosive shells), 2 store wagons, 1 field forge, 1 forage, and 1 provision wagon.

The distribution of the battery is so far changed that the 1st line of wagons consists of 4 ammunition wagons in place of 3 ammunition wagons and 1 store wagon, as formerly; the reserve horses are also new. The 2nd line comprises the remaining 5 ammunition wagons and the store wagon, which belonged formerly to the 1st line, and which contains the most necessary stores for maintaining the fighting efficiency of the guns; the 2nd store wagon and the field forge have been relegated from the 2nd line of wagons to the baggage. Notwithstanding, therefore, that the battery has one ammunition wagon more, the number of vehicles that appear on the field of battle is reduced by one. The 2nd line which followed formerly in rear of the divisions, and was thereby far removed from its batteries, is now to follow the artillery formations, being massed by brigade divisions. With advanced guards, flank detachments, &c., they are to follow the rearmost troops, as previously. By the addition of a 4th ammunition wagon to the fighting battery it is now in a position to sustain an action of at least two hours' duration, by which it is ensured that no want of ammunition will arise before the arrival of the 2nd line of wagons. This is made doubly certain by the

place for these wagons being laid down as not further than 600 m. (previously 800 m.) behind the firing position. As the first position, that of the advanced guard, will often be beyond the sphere of shrapnel (3,150 m.), the 1st line of wagons should include a high-explosive ammunition wagon, for at extreme ranges this projectile has more effect than shell.

As regards changes in the regulations, the placing of batteries in échelon, according to the direction of the wind, has been cut out, which is entirely due to the introduction of smokeless powder. The importance, also, of maintaining large intervals between batteries, to facilitate observation, is diminished; as there will not, in future, be any smoke cloud to impede the view, the commander of a battery is no longer obliged to observe from one of the flanks. Consequently the paragraph prescribing that, in case of necessity, the intervals between guns might be reduced to 10 paces, in order to keep greater intervals between batteries, has been struck out, and it is laid down that it is most disadvantageous to reduce these intervals to 10 paces without pressing reasons, especially during the artillery engagement.

The increased effect of artillery fire, and especially, also, of infantry fire, is reckoned with in different particulars. Thus, the necessity is specially dwelt on of covering the artillery from the enemy's rifle fire by means of infantry pushed forward for the purpose, a view that has been advocated by artillery tacticians ever since 1876 (Hoffbauer). In our opinion, the infantry must be advanced at least 400 to 600 m. beyond the artillery line, from which it follows that, for the artillery accompanying the infantry attack, 1,000 to 1,200 m. must be regarded as a rule as the shortest range, because the main firing position of the infantry, under the shelter of which the artillery must be posted, is estimated to be at 600 m.

On all occasions, even in the attack, when time is available, intrenchments should be thrown up for the shelter of the men. As these trenches run on both sides of the gun emplacement, the work can be interrupted at any time and resumed again during any spare moments.

The employment of smokeless powder has removed from the eyes of the artillery the bandage which has covered many a bold movement, and has greatly increased the difficulty of changing position. Such a movement, therefore, is to be avoided as far as possible, and, in a certain sense, the tactics of the first rifled gun must be reverted to. The regulations, therefore, prescribe that with regard to the attack, the first fire position, in taking up which the advantage of surprise can be utilized, "should always be chosen as near as the circumstances permit."

Tactics of Fortress Warfare.

The events of the past year with regard to fortress warfare have completely justified the opinion, expressed in last year's Reports, that the developments demanded by the advance of science would be carried out without extreme measures being adopted in any direction. Whether we look to the east or the west, everywhere States are to be

seen at work, strengthening the systems of land defence, either by means of the further construction in accordance with modern views of fortifications already commenced, or by making new ones at points which, by the altered conditions of the time, have become important. Even where, hitherto, these efforts had been disregarded, whether because sufficient importance was not attributed to fortress warfare, or because the expenditure of large sums on the field army was considered more necessary and profitable, it has been no longer possible to stand aloof from the general endeavour, as is shown, for example, by General Brialmont being called to Constantinople. In this circumstance, also, is to be found the proof that, taken altogether, the system of fortification proposed by this authority, and frequently put into practice, but which, in the course of time, has undergone many changes, and regarding which Welitschko, Gandier, Mougin, &c., have made proposals worthy of notice, still continues to be the appropriate one, and that, in the near future, it will still serve as the foundation in the new designs of fortresses. Hand and hand with these efforts in the several States are the measures taken to place the fortifications created in a condition to requite, in case of war, the great sacrifices in money caused by their construction. To this subject belong the increase, better organization and training of the fortress troops, in which respect Russia has surpassed all other States, for we hear, there, year by year, of the formation of new infantry and artillery fortress battalions, of the increase and the improved organization of these troops, as well as of the engineer services. The same applies in that country to the training of these troops, which is carried out regularly every year, and includes exercises on a large scale. Other indications, such as the new organization of the technical troops in Austria-Hungary, the increase, long recognised as necessary, of the foot artillery in Germany, and which, at last, is to be effected in the new military establishments, &c., show that it has been universally acknowledged that fortress warfare will, in the future, play, perhaps, a more important *rôle* than it has ever done before. Nothing has as yet been effected in the shape of a new organization to embrace all the fortress troops; but there are signs that this is the final aim of the various efforts that are being made.

Lastly, in order to prepare in time of peace for the appropriate employment of the fortress troops in eventual internal defence, some States, as, for instance, Russia, England, &c., have exerted themselves to define certain territorial districts, placing them each under a single commander, who, on the necessity arising, is in a position to combine the personnel and matériel, or to distribute them as required.

The constant progress in the perfection of the material means of action has, in the course of time, also induced changes in the tactical views. Not so long ago, it was accepted that in the struggle between attacker and defender, the chief point was, which of them should be in position for the great decisive artillery contest at the right time, with superior strength and with the most effective kinds of ordnance and calibres, so as to break down the opposing resistance, and that,

as a rule, the fate of a fortified place depended on the result of this struggle, for the time if not for ever. Now the conviction is gaining ground that, by the side of this effort to obtain the superior power, surprise and stratagem will again come into prominence in connection with undertakings in fortress warfare.

The defender may be convinced that, even though he starts with the advantage over the attacker, has made his position as strong as possible, with all the modern technical means at his disposal, and prepared it for the contest, the moment will soon arrive when the hostile artillery, having taken up its position and got the ranges, will destroy his strongest shelter, and render his first position untenable. While endeavouring to postpone this moment as long as possible, the defender should, therefore, from the first, also strive to establish as many new positions as possible, in order to continue the fight from them or recommence it by means of guns sent back from untenable positions or drawn from the reserve. In acting thus, the prospects of success will be proportional to the secrecy with which the arrangements are made and the degree of surprise with which the newly-armed positions can open fire. But it is not alone the artillery that must act from this point of view; the infantry of the defenders will now, after their fire effect has been intensified to almost the highest possible point, better fulfil their task by independent enterprises against the attackers, and it is an old experience that in these only stratagem and surprise can generally achieve sucess. The infantry is now materially better suited for these undertakings, because not only its power for attack, even in small numbers, is so much increased by means of the rapid results gained through the enormous fire effect (especially in a surprise), but, also, because the earlier fear of failure and of being cut off is materially lessened by the increased fire power, and capability of resistance and independence.

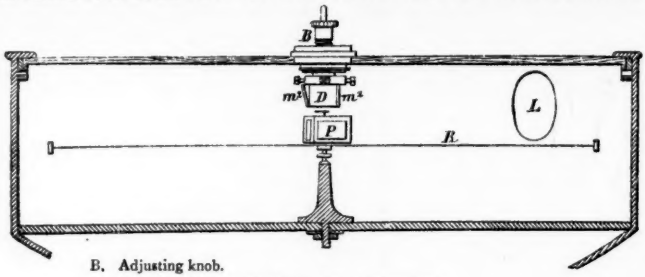
For the attacker, the consideration will be intensified that the earthworks thrown up for the protection of his batteries cannot stand against the enemy's fire when once his guns have concentrated on them and got their range; they can then no longer afford shelter.

What he has to do, therefore, is to deceive the enemy as long as possible with regard to his position, to prepare cover and masks as quickly as possible, and to attack with unexpected and, if practicable, superior fire, so as to gain a success before the defender is ready with his counter-measures. If the attacker fails in this, he must have, in the meantime, prepared intermediate positions, from which a further attempt can be made.

The attacker, therefore, as well as the defender, will have, in future, to exercise the personnel in the construction of batteries, employing for the purpose appropriate instructions and material.

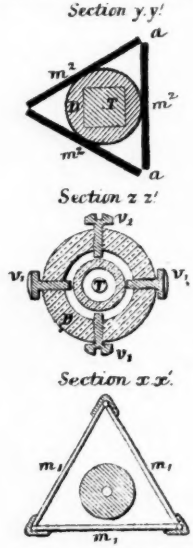
The defender will be forced, more and more, to resort to offensive enterprises in the defence; and, as well as the attacker, will have, owing to the improvements in the fire effect, to adopt a more movable attitude. Guns of moderate weight, and, principally, of high elevation, will come more and more into prominence; guns of the heaviest calibre will fall more and more into disuse.

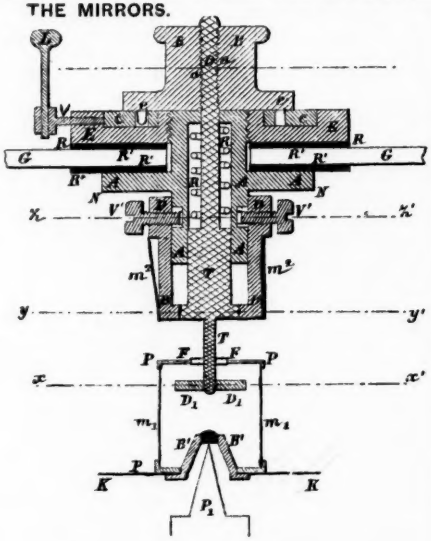
FIG. 1.
GENERAL ARRANGEMENT OF THE APPARATUS ON THE COMPASS.



B. Adjusting knob.
L. Lens for projecting the image of the luminous line.
$m^2 m^2$ Mirrors for reflecting the upper fixed line.
P. Prism of mirrors on the Compass Card for reflecting the lower or movable line.
R. Compass Card.

FIG. 2.
SHOWING THE DETAILS AND METHOD OF FIXING AND ADJUSTING THE MIRRORS.





G. G. Glass of the Compass.
R¹ R¹ Indiarubber washers.
B. B. Adjusting knob.
T. T. Adjusting spindle.
F. E. Screwed, securing washer.
C. C. Holding ring.
V. Set screw.
L. Lever of set screw.
A. A. A. Fixed cylinder.
D. D. D. Movable cylinder
D_1 D_1 Disc.
P. P. P. Prism of movable mirrors.
$m^2 m^2 m^2$ Fixed mirrors.
m_1 m_1 m_1 Movable mirrors.
B¹ B¹ Centre bearing of compass card.
P_1 Pivot of compass card.
K. K Compass card.
V. V. V. Screws of movable cylinder.
R. R. Spiral spring.

HARRISON & SONS, LITH. ST MARTINS LANE

THE LÉPHAY LUMINOUS COMPASS.

In the April number of the Journal we gave a short description of the "Léphay" luminous compass, experiments with which have been carried on with very satisfactory results for some time past in several French ships. We are now enabled to give further details, taken from an article in a late number of the "Revue Maritime et Coloniale," written by the inventor, Lieutenant-de-vaisseau I. Léphay, and which have been furnished to us by a correspondent.

The inventor claims for his system the following advantages:—

1. The man at the helm can maintain contact between two luminous tracts much more easily than he can maintain the correct agreement of the degree marked on the card for a given course with the lubber line on the compass, the compass card being very often imperfectly illuminated and too far from the eyes. There being no need for the helmsman to know the course, there is no risk of error in passing on the orders when relieving the helm.

2. Control at a distance is made a reality for the officer on watch, as he can easily distinguish the luminous marks at some yards' distance.

3. Other things being equal, the course error will always be, at the most, only half of what it is with the present system, since the angular displacement of the luminous tract reflected from the centre of the card will be double the actual angular displacement of the card itself; and in addition to this any degree of accuracy which may be desired might be obtained by projecting the luminous tracts sufficiently in advance of the compass.

4. The separation of the tracts, due to deflections from the course, is twice as rapid in movement as the actual deflection of the card; resulting in the more prompt action of the helmsman, with smaller angles of helm in executing the required correction.

5. The mirrors having been adjusted for the course, and the required agreement of the luminous lines once obtained, there is no necessity to illuminate the compass card directly; consequently, the whole of the compass being in shadow, the eyes of the helmsman or the officer of the watch are not weakened by the flare, as in the present compass.

6. For the same reason, surrounding objects can be much better observed from this absence of light close at hand. The card can be illuminated, and the indications read off at any part of the forward half of it, at the will of the observer, by directing a portion of the rays from the source of light for the luminous lines on to its surface, and the same method can be used for illuminating a portion of the card in the vicinity of the luminous lines to check the course when steering by these only.

The following points have to be realized in fitting the compass for use with the above system :—

1. To project on the internal surface of the compass box a vertical line of light emitted from a source exterior to it, but following its movements, so that the position of the line of light will not be affected by the pitching and rolling of the ship.

2. To fix on the card on its centre, or very near to this point, a small mirror serving to reflect the rays introduced into the interior of the compass towards the exterior. This mirror, so light as not to increase the weight of the card to more than 12 or 15 grammes, must be easily capable of adjustment from the outside for the required course, and, when once adjusted, must maintain its position without being influenced by the movement of the card, or by accidental shocks.

3. To fix a second mirror on the glass of the compass box immediately above the mirror on the card, its object being to produce a fixed luminous line, by means of which the movements of the compass card and its line of light are expressed; both mirrors must be capable of adjustment in the same vertical plane.

4. The practical details of the entire system should be as simple as possible, and give every guarantee of security which such an important instrument on board ship must possess.

5. It is essential that the general principles of the construction and arrangement of the Thomson's compass should be respected, and the adjustment and practical working of this instrument, so perfect for navigation purposes, must remain absolutely unaltered.

The author then gives a full description, with sketches, of the mode of fitting up all the details of this compass in the French Navy, and full instructions for adjusting and using it. It has been fitted on board the "Marengo" and "Épervier," and has worked very satisfactorily for a period of three years on board the transport "Isère," where it was fitted as a preliminary experiment. It may be added that the two vertical luminous indicating lines, the one fixed, the other following the movement of the compass card, are produced with definite figures and sharply defined edges by means of a lens and an adjustable slit in very fine metal, the figures being one above and the other below a thick black horizontal line, which can be graduated off in divisions, representing either points or degrees.

The general arrangement is shown in Fig 1, and the details of the method of fitting and adjusting the mirrors in Fig. 2; these sketches it is hoped will be sufficient to give a good idea of the compass without further explanation.

SOME OPINIONS OF THE WHITEHEAD TORPEDO AND ITS RELATION TO MODERN ARMAMENTS AND TACTICS.

Compiled by T. J. HADDY, R.N., principally from "Mittheilungen aus dem Gebiete des Seewesens."

NOTWITHSTANDING the advance which has been made in the destructive powers of modern artillery, both for men and material, the Whitehead torpedo still maintains its position as the weapon most feared by naval men. That this fear and apprehension are well founded may be allowed when we recognise that the ordinary 14-in. torpedo, carrying a charge of less than 100 lbs. of guncotton, is capable of making a hole 200 sq. ft. in area in the bottom of a well-built iron ship, as was proved in the case of the "Blanco Encalada," in Caldera Bay; it may, therefore, be admitted without question that any ship now in existence, or likely to be built in the near future, would founder almost immediately from the effects of a successful shot by the modern 18-in. torpedo. The torpedo in itself is practically the same in all European navies, and is now being introduced into the American navy, so that, in relation to this weapon, all stand practically on an even footing, although the experts of each country may consider their own weapons more perfect and their methods of using them superior to those of other nations. Unfortunately, the torpedo depends for its success entirely on the correct adjustment of numerous mechanical details, which is a defect almost fatal to its utility as a weapon for naval purposes, where it must be handled and fought by men more or less destitute of any definite mechanical training, and who are generally further hampered by having to use transporting and loading appliances altogether inadequate to the careful treatment of such a delicate machine. The discharging tubes, at least above water, are very similar in all nations, the differences being merely in the details, and they do not affect the general results. As regards submerged discharge right ahead and right astern, the former does not present many mechanical difficulties to be overcome, and has been much esteemed, except, perhaps, in our own navy, from tactical considerations, and from the fact that very successful running can be obtained from it; but its importance does not appear to be so much insisted on as formerly. The astern submerged discharge is reported to have been tried in the Italian navy, as described in the "R.U.S.I. Journal" for August last, but the disadvantages of such an arrangement as is there shown are obvious, the risk of injury to which the outside rudder connections are exposed being one of the most important. It will have been observed also, from what has lately appeared in this Journal, that great efforts are being made by France to obtain a sub-

merged discharge on the broadside which shall be superior to our own, whilst its value has been much questioned by other competent judges, more especially in the Italian navy, and it does not appear at all clear whether a desire and determination to overcome mechanical difficulties has not had as much influence in bringing about its adoption by ourselves as a decided conviction of its tactical importance. An examination into the questions concerning the proper instant for discharging the torpedo under the different angles of training, bearing, distance, course, and speed of contending ships, which have been considered in the "Mittheilungen," is omitted here, as they only involve simple mathematical considerations and are fully considered by all nations in the regulations for the guidance of torpedo officers. The question of vital importance is how to manœuvre your own ship so as to have the enemy at a disadvantage at the supreme moment when the torpedo can be discharged, and, as relating to this question and incidentally to the importance of fixed submerged broadside tubes, the following observations from the "Mittheilungen aus dem Gebiete des Seewesens" may be of interest:—

F. Attlmayr there says, that "the most favourable condition for the employment of the torpedo is that in which the enemy's ship crosses its line of fire, or the direction of its path, at right angles or nearly so, thus offering her whole broadside as a target;" and we may add that the chance of a successful shot will decrease almost directly with the decrease of the angle of transit across the line of fire, and is a minimum in the "end-on" position for a shot from a broadside tube. The direct, or "end-on," position will always come in when ships manœuvre against each other bow to bow, or when one follows the other in the direct line of keel; in both instances the area of target is the minimum, but the distances at which the torpedo can be discharged differ, and in the former case must be large enough to allow time for the discharging ship's course to be altered slightly, so as to enable her to pass clear of her opponent; unless she has perfect confidence in the strength of her own prow to withstand the shock of collision, a confidence which we may assume would be exceedingly rare. This deviation from the direct course must be the smallest possible to effect the desired end, or the ship would be in danger either of a shot from her opponent's bow tube or an attempt to ram. It is very doubtful if such a dangerous manœuvre would be deliberately and designedly attempted with ships at all equally matched, as it would almost surely result in the destruction or disablement of one or both of them. If both ships held on their course, it would largely be a trial of nerve and determination as to which had the best of it; the temptation would be to discharge the torpedo too soon in order to get an advantage over the enemy by having the first shot, and also to minimize the risk of ramming with the torpedo still in the tube, but the chance of an effective shot would be enormously decreased by firing at such a small and angular target at a comparatively long range.

In the case of a ship following another in the line of keel, the distance between them must be very small to give the pursuing ship much chance of using her torpedo effectively, considering that the

torpedo would have to travel double this distance, assuming its speed to be double that of the ship attacked, a fair assumption under actual conditions, and that the torpedo would be very likely to be deflected by the disturbed water in the wake of the ship's propellers. The advantage which the following ship has is that she has the movements of the other under her control so long as she is not considerably overmatched in speed; but the ship chased has every change in the distance between her and her pursuer in her favour, every decrease giving her the opportunity to use her torpedo more effectively, and every increase greater chance of escaping altogether. When a change of course is necessary in order to bring one or other of the torpedo-tubes to bear, it is essential that the torpedo should not be discharged during this change of course, and not until the ship is again steady; also that, if discharged above water, it should be ejected clear of the disturbed water at the ship's side.

When ships are manœuvring at close quarters in order to use their torpedoes, changes of course will be frequent, and neither ship will be altogether free to choose her own movements, as each must act with due regard to her own safety. It must be observed that, however short a time may be necessary for a ship to steady herself on a course after a manœuvre, this will be an important factor in action, as an interval of a few seconds may be of the utmost importance or even decisive. To use her torpedo, a change of course may often be rendered necessary when not imposed on her by other considerations at the moment, and this will be especially the case when she only has a limited number of fixed tubes. As regards the employment of the fixed right-ahead tube, the conclusion on the whole is that, with ships fairly matched and manœuvred, its employment would be purely problematical, the more so as it would be hardly possible that the angle of the path of the torpedo with the course of the enemy would in any case exceed 2 to 3 points, and only when the speed of the attacking ship is very largely in excess of that of her opponent would there be much chance to use the right-ahead tube effectively. The general conclusions from an examination into numerous possible conditions of attack and defence are that the torpedo should only be discharged as before mentioned while the ship is steady on her course, and from this it follows that the possibility of using her torpedo effectively should depend as little as possible on the direction of the ship's course at the time, and that it should in no case be first necessary for the ship to be put in any determinate course in order to use her torpedoes. This object can be attained when the tubes are not fixed, and even if the training is very limited the conditions in favour of using the torpedoes are very much improved, for they are not altogether dependent on the course of the ship; with fixed tubes, three on each broadside are necessary, one on the bow, one on the quarter, and one on the beam; the importance of the first two positions for ships nearing or passing each other on almost any bearing is unquestionable, and it is absolutely impossible for an enemy's ship to come within launching distance of a ship armed as above without coming under the fire of one or other of the torpedo-tubes.

Independence of the actual course of the vessel at the instant of launching is of primary importance in the employment of torpedoes; if this condition obtains, there is a much greater probability of hitting the enemy without exposing your own broadside to his attack, while at the same time the whole length of the ship attacked may be at right angles, or nearly so, with the path of the torpedo discharged at her. The torpedo may be used in the manner described either as a weapon of defence, for which purpose it may be implicitly relied on, or on the offensive, in which case it will force the enemy to keep at a distance. On the question of what chance a ship has of escaping from the torpedo which she has seen discharged at her, the conclusion is that if the torpedo has been correctly aimed and runs well the chances of escape are very small indeed; the best manœuvre would be for the ship to put her helm hard over and turn away from the enemy, which would have the effect of reducing the area of the target and perhaps of deflecting the torpedo by the disturbed water caused by the action of the ship's propellers; there would be no chance of escape by sudden increase or decrease of speed, the distance being too small and the inertia of the ship too great to be overcome in the time. When we consider the probabilities of the torpedo hitting its object, and the necessary tactics to be adopted for its employment, we arrive at the following important generalizations:—The torpedo is in itself a terrible weapon; one hit may prove decisive; but, to use it effectively, conditions are imposed which are not always in the power of the commander of a ship to obtain. The torpedo, then, will find its sphere of greatest activity when the enemy is not altogether free in his movements, and consequently may form the object of an attack by a preconcerted manœuvre. Also on the unexpected meetings of fleets and squadrons before the tactical formation has been fully decided on, or in the intentional manœuvre of breaking the line of formation by one side or the other, the torpedo may have an important part to play. When the *mêlée* is fully developed, opportunities may offer for torpedo discharge, but regard for the security of the ship will limit its employment to a very large extent. For the rest, the view that the presence of torpedo-boats in the *mêlée* would be the cause of more danger to their own ships than would the torpedoes discharged from the ships of the enemy is not without some justification; under any circumstances, however, great importance must be attached to an effective shot at the first approach of the enemy, as it is very probable that it would have the effect of determining the result of the engagement in favour of the side fortunate enough to make it. In general, it may be said that the torpedo on board battle-ships should be considered rather as a defensive than an offensive weapon, since its employment necessitates an engagement at close quarters, under which conditions the ram also is destined to play an important part, and manœuvres must be avoided which are calculated to afford the enemy an opportunity for this mode of attack.

Torpedoes must, therefore, be capable of being used without any, or, at least, with only the very slightest, alteration in the course of the ship, in

order that any attempt to ram on the part of the enemy may be promptly met; as before mentioned, this object can be attained by the number and arrangement of the launching tubes carried. Only in this way can danger and uncertainty in manœuvre be as far as possible prevented, and any movement avoided which may afford the enemy an attempt to ram, without himself falling a victim to a torpedo discharge; this will be of the utmost importance if a ship should find herself engaged with two of the enemy, as in the case of an attack by breaking the line of formation. If we compare the torpedo with the other weapons forming a ship's armament, it has, as regards the ram, the immense advantage that no direct contact with the enemy is necessary, but within certain limits equal results can be obtained at a distance. The ram also is in the highest degree a weapon of offence, and for its employment the initiative must be assured by rendering the enemy more or less hampered in his movements, whilst the torpedo, if installed on board as we have suggested, may be used without being limited by any such condition; besides which it is not necessarily used only for the attack, but, on the contrary, must be regarded as a most powerful and decisive weapon for defensive purposes. The first principle to be observed in using the ram is to present the bow continually to the enemy, and when possible to turn it against his side; but, to meet this latter manœuvre, an opportunity is afforded for the torpedo if it can be discharged on the bow, either in a slanting direction with the course of the enemy, or as nearly as possible at right angles to it. If in using the ram a ship should succeed in coming down on her opponent within 4 points of the beam, her torpedoes are not much to be feared, but in this case also the discharges should be so arranged that the torpedo could be employed to meet the attack. Great handiness is of the first importance for ramming manœuvres, but not so much so for the torpedo if the ship is adequately supplied with launching tubes properly arranged; the latter condition is of special importance for ships which require considerable room to turn in.

As regards artillery, the torpedo is exclusively the weapon for close quarters, artillery is both for fighting at close quarters and at long distances. The accuracy of the gun is incomparably greater than that of the torpedo, and its employment far less dependent on the manœuvring of the ship and the state of the sea, but against this it must be allowed that as a rule a successful torpedo discharge would have far more disastrous results for the enemy than one or more hits by the gun, according to the nature and weight of the projectile. What we must here, however, especially emphasize is the consideration that the importance of the torpedo, if discharged from above water, may be considerably lessened, if not altogether nullified, by the artillery; and this method of discharge therefore claims our closest attention and consideration. Against the heavy guns of comparatively slow fire, the speed of the ship may afford a slight but insufficient protection, but it is far otherwise in the case of the quick-firing guns, especially the quick-firing guns of large calibres now in use; against which only comparatively thick armour can

afford any protection whatever. We need not reflect only on the work of destruction which such guns are capable of effecting far beyond the range of the torpedo, but also on the moral effect on the unprotected or insufficiently protected torpedo crews, who have to handle the torpedo under the heavy fire of such weapons as are now carried in modern ships-of-war. However much it may be desired to have torpedo-tubes capable of being trained, this object must be given up when the difficulty of sufficiently protecting them cannot be overcome. We must then have recourse to fixed tubes and find a remedy, as we have already frequently observed, in their numbers and the method of installing them.

The following remarks of F. Attlmayr deal exclusively with the torpedo and quick-firing guns of large calibres, and for the purpose of fixing the ideas, he describes the probable course of a duel between a ship A, which relies principally on her powerful armament of quick-firing artillery, and another ship B, which pins her faith on her torpedo equipment. A will endeavour to keep B at a distance and position in which she would be subjected to the most effective fire of the quick-firing guns, until she is so far disabled that a nearer approach might be risked without danger from her torpedoes; this will necessitate an almost similar course to that of the enemy, A approaching and receding from B as occasion requires in order to maintain the above relative positions and distance, and B, on her part, would endeavour to come within launching distance of A as quickly as possible, at the same time taking care not to expose her broadside during the approach. This could be effected most quickly by B coming down on A in an opposite, or nearly opposite, course, and this she would take the first opportunity of doing; she would thereby also prevent A from using her artillery under the most effective conditions, seeing that direction and range would be rapidly changing. By this manœuvre it is inevitable that B in passing will present her broadside to A, and run the risk of having her above-water discharges damaged; but, on one side, it may be said that the ships will pass each other in a few seconds, even at moderate speeds (for instance, in 10 secs. if both ships have a speed of 10 knots), and, on the other, that B will discharge her torpedo before she is abeam of her opponent. If B uses a fixed tube on the bow, or a training tube, there is no question about her discharging her torpedo before coming abeam of A; but if she has to use a fixed tube on the beam, she will have to carefully calculate the speed of the enemy and that of her own torpedo, and shape her course to pass A at such a distance as will enable her to use her torpedo before she is abeam, without risk of a lost shot by the torpedo passing ahead of A. The speed of A, for instance, is 12 knots, that of the torpedo 13 m. per second; in this case B can discharge her torpedo a ship's length (say, 100 m.) ahead of A if she is at a distance of something over 200 m. or $1\frac{1}{4}$ cables when abeam. If, however, only one torpedo has taken effect, the further course of the struggle can be decided and the ram come into action instead of the torpedo. We will now enquire in what way and to what extent these tactics of each ship can be realized. A and B sight each other; B shapes

course against A, and comes down on her at full speed; A, on the other hand, allows herself to be chased, and B will endeavour to hold her position astern of A so as to avoid the combined fire of her broadside and right-astern quick-firing guns; this A will try to counteract by increasing speed and altering course, so as to bring as many guns as possible into action; this will result in the ships following either a curved or zig-zag course, according to circumstances; A will cover more ground than B, as B only has to keep her head constantly directed against the stern of A at every change in her direction. From this it follows that, if both ships are equal in speed, B will gradually overhaul A, but so slowly that the latter may reckon on effecting her object in spite of the fact that she has not been able to use her artillery to the greatest advantage. If, however, B is efficiently protected by armour forward, and her torpedo-discharges also protected and isolated from each other, the chances of success for her are undoubtedly greatly increased, but not assured; for B must, as before pointed out, approach very close to A (to within about 200 m.) before she could count on a successful shot with her right-ahead torpedo-tube previous to presenting her broadside to her antagonist. At this instant it would be of great moment to B that she should have a tube on the bow; this is under all conditions an advantage, but especially so when, after firing the right-ahead torpedo, a change of course is necessary; and, as above described, a tube in this position may even be of greater importance than one right-ahead. As regards A, the best position for her would be on the quarter of her opponent —of course out of torpedo-range and within effective gun-fire; she would then have a better control of her own movements, and B would be less free in hers; this position would only be dangerous for A if she is much inferior to B in speed, when the possibility must not be entirely left out of consideration that B, in order to have an effective shot with her torpedo, will approach so near to A that the latter will also run the risk of being rammed by her. It can therefore be allowed, as a rule, that A will promptly alter course to the opposite direction when she perceives that an approach within launching distance of B cannot be avoided; and that the right time for this manœuvre will be such that she is still beyond launching distance after completing it. It is not likely that B will alter course at the same instant, as she would give up her advantageous position, and could not use her torpedoes while altering course, supposing she should find herself within launching distance of A during the manœuvre.

As regards the broadside torpedo-tube on the beam, it must be borne in mind that, in order to use it, B, according to the distance, must have reached a position either before or abeam of A. To reach this position, however, B requires time, and it is not a question of seconds, as when passing on opposite courses, but of minutes; for example, in the previous case, if the speed of B is 15 knots against the 12 knots of A, more than a minute will be required for B to reach a position abeam of A from a position just astern, that is, to gain half a ship's length. If, instead of overhauling A, B should endeavour to use her beam tube by altering course, she can only do so when she is

very close indeed to A, and then only when she is steady on her course. By this manœuvre, also, B presents her broadside, and A can, if she thinks the opportunity favourable, and so desires, keep away from her. As may be gathered from the foregoing, the position of A is a dangerous one, if broadside torpedo-tubes on the beam come into operation, should she be overhauled by B, but not so dangerous as to preclude any hope of the final result. The position is much worse for her if B carries a right-ahead discharge or one on the bow; in this position, as already observed, B's ram may come into play, and, considering her superior speed, the position of A becomes something more than serious. It is therefore advisable, when A's speed is not, at least, equal to that of B, that she should avoid the risk of such a dangerous position by a timely alteration of course. If A, by allowing herself to be chased, discovers that she is not equal in speed to B, she should, by changing course at the right distance, endeavour to pass B outside launching distance, and as nearly as possible on an opposite course, repeating the manœuvre as often as B herself alters her direction; but should she find it not in her power to effect this, she should lay B aboard as close as possible, or attempt to ram her, and in this way, by compelling her to frequently alter her course, prevent her from using her torpedoes. It has been said that for A the best position is on B's quarter; it remains to be explained how she can get into this position, and it appears that this would only be possible if B is badly manœuvred or is much inferior in speed to A, but, the position once obtained, it could be held, whatever course B might take. It is clear, from the illustrations we have presented so far, that B would not often approach A at launching distance in the manner and in accordance with the principles we laid down at the commencement of this discussion; this would only be the case when the ships approach each other in opposite, or nearly opposite, directions. In general, the same principles will hold good in engagements between fleets of ships as obtain in the duels of single ships, and the same method of illustration may be used; A representing the fleet whose strong point is the possession of numerous quick-firing guns of large calibres, and B the fleet whose strong feature is the perfection and completeness of its torpedo equipment. A great deal of the argument, as regards the employment of the quick-firing guns only, against the torpedoes only, would lead us into a repetition of what has been considered already in treating of the duel between the single ships A and B, and, as such limited conditions are not at all likely to occur in actual warfare, it will be better to proceed at once with what our author has to say when the heavy guns are brought into play. "We may start with the permissible assumption that both fleets will be provided with heavy artillery, but if the guns of B fleet are so arranged that they can be used in the direction of its course or within a very small angle with it, it will have an immense advantage over A fleet, whose guns are not so arranged, seeing that the A ships must present their broadsides to the bow or 'end-on position' of the B ships, with a much greater probability of the former being disabled by a lucky shot from one of the

heavy guns during the attack than is the case with the latter. A will then do well to avoid such an attack by B as is here supposed (a direct onset) by a timely change of course in the same direction; the general conclusion is that, if the fighting range is not greater than 2,000 m., the risk of loss to which that fleet is exposed which seeks to engage the enemy by direct attack does not appear to be so great as to put any such manœuvre entirely out of the question, seeing that under such conditions it will not be purely a question of artillery on either side. When it is desired on both sides to limit the engagement to an artillery duel alone, the result will be that the courses of the fleets and the speed of the ships on each side will be maintained approximately alike. The fleet which is weak in artillery will, on this account, endeavour to close with the other at a favourable opportunity, when the distance is suitable (*i.e.*, inside 2,000 m.) by altering course and increasing speed. Each side, must, therefore, be on guard against such an attack; a distance of 2,000 m. does not allow much time to carry out a manœuvre by signal from the leader to meet such an attack by the enemy, especially when we consider that, by reason of smoke, extension of the line, &c., communication by signal may be difficult, and under such conditions a delay of a minute would be of the highest importance; for this reason, it follows that Commanding Officers of ships should be instructed beforehand how to act when they find themselves placed in such circumstances. When a fleet consists of a large number of ships, although the plan of attack involves the use of artillery alone, they should be divided into sections or divisions, tactically independent so far as the united action of the fleet will permit. Commanders of divisions must, then, be permitted to act independently in difficult circumstances, when it appears probable that a certain plan of action will tend to bring about a favourable result; by this means, the dangers may be avoided and difficulties met which an involuntary *mêlée* must bring with it. Rear-Admiral Long, in his article 'On the Probable Influence of Quick-firing Artillery on Naval Tactics and Ship Design,' says, 'Such a condition as this (*mêlée*), which presents to our view a disorganized mass of ships, can only be a temporary one with a disciplined navy, and, even then, can only happen when all the leaders have fallen in action, and the means of communication have been interrupted.' We must maintain, on the contrary, that such a state of affairs can only be prevented whilst the fleet is completely master of its own movements, and, therefore, the fight is carried on at such a distance that the whole of the artillery of the ships is not yet fully brought into action. If the enemy is in close formation, the ships at 2 cables distance, the collision of the fleets by an attack such as is here treated of could not take place without the order of the ships being disturbed on both sides, with the difference, however, that the attacking fleet intentionally, and with a view to a certain end, breaks its formation, whilst the fleet attacked is forced into it and obliged to have regard, not only to the movements of the attacking ships, but also to the manœuvring of its own ships, ranged astern of each other, so as to avoid collisions. If the attack is directed against one point of the

enemy's formation, the ships at the point attacked must alter course, either towards the attacking fleet, if there is sufficient room, or away from it; in close formation, an attempt to ram will necessarily result from this mode of attack, but it will hardly afford an opportunity for using the torpedo, and the fire of the ships will probably be considerably limited by regard for the safety of their own side. In the 'front formation' of the enemy this disturbance will extend more or less to the wing ships; with 'head and stern' formation, which is here principally considered, the ships astern of the point of attack will be first in difficulties, as their way is checked and they are forced to break out of the line, whilst, on account of their own and the opposing ships, their choice of a course is not always a free one. The ships ahead of the point of attack would also hesitate in their course, in all probability, and not persist further in one that would withdraw them from the field of battle. The fire of manœuvring ships, however, it should be noted, would not be fraught with so much danger to others as would that of ships on a steady course. It is, therefore, not so certain as Rear-Admiral Long appeared to think, that breaking the line of formation would be effected at the cost of drawing a superior artillery fire on the attacking ships. Many shots do not always mean many hits, and rapid firing brings with it a decreased probability of hitting; even by the employment of so-called smokeless powder a disturbing smoke cloud is not altogether avoided. The value of quick-firing guns does not lie alone in their rapidity of fire, but rather in the fact that with them every favourable opportunity can be seized, seeing that they are constantly ready for use at a moment's notice.

"To consider briefly the conclusion of the question how far quick-firing artillery may replace the above-water torpedo-tubes, it is clear from what we have said that the employment of such torpedoes, leaving chance out of the question, must depend on two conditions—viz., before everything else an effective armour protection both for the ship and the torpedo-tubes, and, secondly, an exceptionally high speed for the ship. These necessary qualifications are also identical with those required for a successful ram, so that, as already observed, the torpedo is only the final and perfecting weapon of a ship designed more particularly for this mode of attack. When both these qualifications, especially the first, are not fulfilled or not possible of attainment, it would be better to do away with the torpedo-tubes above water, and substitute quick-firing guns of large calibre, which do not necessitate an approach to within a few hundred metres of the enemy. The introduction of such guns as above has increased the value of armour protection for cruisers, and we may here state, as our opinion, that cruisers without such protection, the vital elements of a battle-ship, are useless for any task whatever in which they may be called to hold their own in promiscuous fighting. Unprotected cruisers are of value only when they have an extraordinarily high speed, and then only when the field of action is a limited one. As regards the armament of such unprotected cruisers, great weight should be given to right-astern fire. Quick-firing guns certainly have not yet been proved in earnest, and as yet do not exceed about 6 ins. in

calibre, so that it may happen that the great expectations formed of them will not be realized in practice. Common prudence and foresight, however, must admit the probability that they will play a very prominent and important part in future amongst the weapons of naval warfare."

No doubt there is much that is debatable in the foregoing, and to many it may appear useless to theorize on the probable course of naval engagements between single ships and fleets without any definite experience as a starting point. But it is certain that the capacity for destruction of modern artillery and torpedoes, as also of the ram, cannot be over-rated, so that it is in the highest degree improbable that any two ships equally matched would be able to withstand for many minutes a duel at point blank range with all their weapons of attack in a serviceable condition. It appears that this consideration very largely detracts from the value of the torpedo as a weapon for battle-ships and large cruisers, seeing that it would only be used to complete the destruction of an already beaten and practically powerless foe. The state of the question as regards torpedoes, according to the opinions of the various naval experts of different nations, may be broadly summarized as follows:—

1. That torpedo-net defences are impracticable and useless as fitted on board modern ships, being only dangerous encumbrances and forming no efficient defence against the torpedoes now in use.
2. That torpedo-tubes above water, if unprotected, would almost certainly be put out of action in a short time by modern quick-firing guns at short ranges.
3. That protected ships carrying heavy artillery would hardly dare to approach each other within launching distance until the artillery fire of one or both of them had been greatly weakened.
4. That a fixed tube on the beam, whether above water or submerged, is, from a tactical point of view, the least likely to be required in *action*, and that all broadside tubes should be capable of some degree of training.
5. That the effect of the introduction of quick-firing guns of large calibre is to limit the employment of torpedoes to small ships and boats of very high speed specially adapted for swift, sudden, and secret attack.

As regards 2, we may add that the torpedo crews also would be annihilated, for experiment has shown that nothing could live if exposed to the shell fire of quick-firing guns for a few minutes only.

The conclusion from all this is that the displacement of large ships can be utilized to the best advantage by giving them, 1st, the greatest possible weight of artillery in the shape of numerous quick-firing guns of large calibre; 2nd, the most effective armour protection possible for the crews of these guns; 3rd, speed and large range of action; 4th, that torpedoes are only absolutely necessary for ships of special design, such as rams and small vessels of extraordinary speed.

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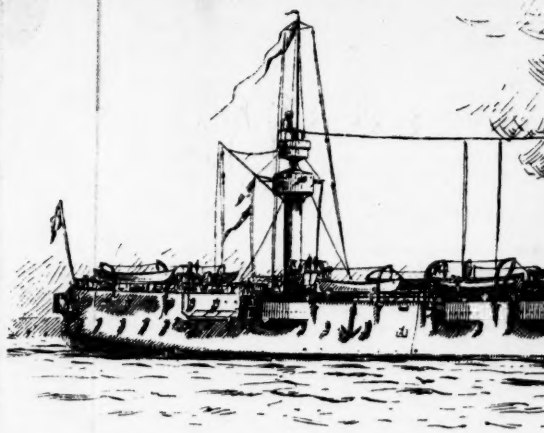

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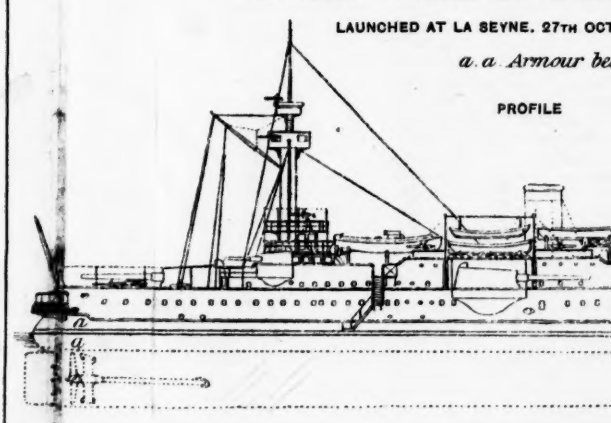
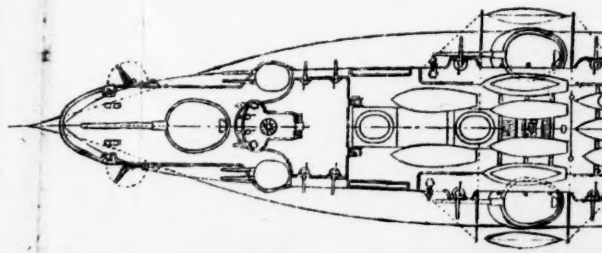
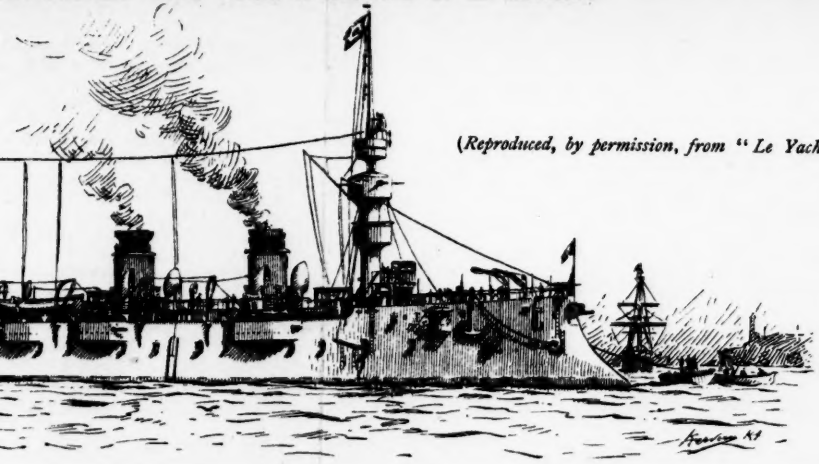




DECK PLAN.

ASS CRUISER "ISLY," FROM A DRAWING BY M. KERVERN.



(Reproduced, by permission, from "Le Yacht.")

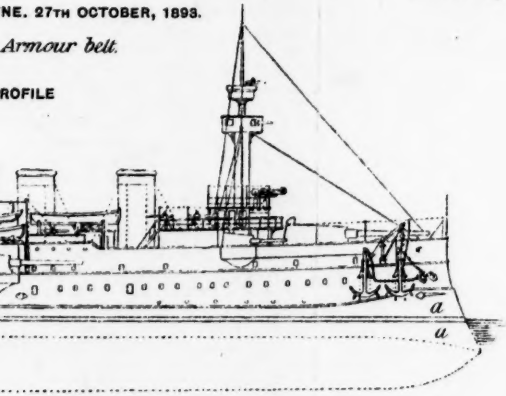
ATTLE-SHIP "JAURÉGUIBERRY."

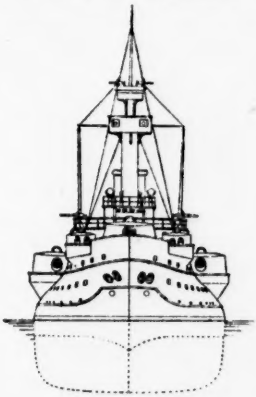
(Reproduced, by permission, from the "Mittheilungen aus dem Gebiete des Seewesens.")

NE. 27TH OCTOBER, 1893.

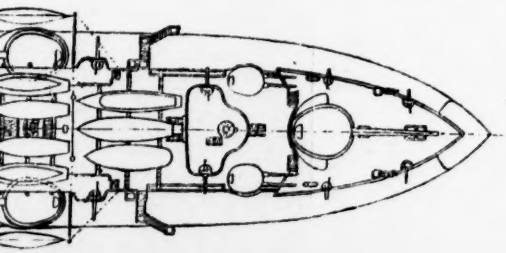
Armour belt.

ROFILE





BOW VIEW.



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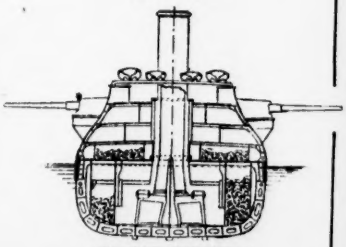

MIDSHIP SECTION.

HARRISON & SONS, LITH., ST MARTINS LANE, W.C.

NAVAL AND MILITARY NOTES.

NAVAL.

Home.—The new 1st class battle-ship "Resolution" has been commissioned by Captain W. Hall for service in the Channel Squadron. The "Howe," which is to be temporarily attached to the Channel, pending the completion of the "Resolution," has left to join the squadron.

The "Colossus" has arrived in England and been paid off; the officers and men of the "Neptune" have been transferred to her, and she takes her place as 1st Reserve ship at Holyhead. The "Inflexible" has also been paid off at Portsmouth, and been recommissioned with the officers and men of the "Nelson" as port guard-ship, in place of the latter.

The 3rd class cruiser "Barracouta" has been commissioned by Commander Foley for the south-east coast of America, and has left for her station.

The 1st class battle-ship "Barfleur," the sister ship to the "Centurion," has completed her trials successfully. Her triple-expansion engines were estimated to indicate 9,000 H.P. under natural draught. The results of the eight hours' run were as follows:—Pressure of steam in boilers, 141·48 lbs.; vacuum in condensers, starboard, 27·3 in., port, 27·7 in.; revolutions, starboard, 95·3 per minute, port, 9·59; I.H.P., starboard, 4,962·18, port, 4,932·2; total, 9,894, or 894 in excess of the contract; speed, 17·1 knots. The trial was conducted with open stokeholds, and the fan engines were not used once during the day; there was a good supply of steam, the engines worked with perfect regularity, and there was an entire absence of hot bearings. The maximum H.P. developed during one hour was 10,615, while 10,070 H.P. was indicated for two consecutive hours. The four hours' forced draught trial was equally satisfactory. The mean results were as follows:—Steam pressure in boiler, 142·4 lbs.; air pressure, 1·4 in.; vacuum, starboard, 27·7 in., port, 27·4 in.; revolutions per minute, starboard, 104·8, port, 105·6; I.H.P., starboard, 6,580·4, port, 6,582·7; aggregate, 13,163·1, being 163·1 H.P. over the contract; the speed was 17·5 knots, which, for some unexplained reason, is 1 knot less than was made by the "Centurion."

The new 1st class torpedo-gunboat "Speedy," built and engined by Messrs. Thornycroft, has successfully concluded a series of exhaustive trials, in order to test more especially the capabilities of the new type of boiler with which she has been fitted by her builders, and which were guaranteed to develop, under forced draught, 1,000 I.H.P. in excess of that promised by other contractors in vessels of the same class and size.

As the trials were of exceptional interest, they were attended by most of the foreign Naval Attachés and other interested visitors.

We have taken the following account from the columns of the "Times." The vessel left Sheerness on October 2 for her natural draught trial. The boilers having been filled with Sheerness water, steam was got up in them to a pressure of 200 lbs. per sq. in. in from 25 to 30 minutes from the time of lighting fires. The following were the mean results of the eight hours' run:—With an air pressure of 0·58 in. in the stokeholds, steam was maintained at a pressure of 183·3 lbs. per sq. in., and with

a vacuum of 27½ in. the engines attained a speed of 206·4 revolutions per minute, and developed a total of 3,043·7 I.H.P., the resultant speed of the ship, with a mean draught of 9 ft. 8½ in., being 18·5 knots.

On October 20 she left Sheerness again for a preliminary forced draught trial; on this occasion her boilers were filled with fresh distilled water. After some hours of admirable steaming on the part of the boilers and good running of the engines, the latter, during part of the time, indicating 4,390 H.P., with the vessel making 20 knots, one of the starboard crank-pins was found to be heating, so the ship was run back to her anchorage with one set of engines, with which she averaged 11 knots. On October 28, the "Speedy" proceeded to sea for her four hours' official forced draught trial. After running for four consecutive half-hours—in which, with steam at 200 lbs. pressure per sq. in. and the engines making 245 revolutions per minute, 4,564·5, 4,674·6, 4,635·9, and 4,708, I.H.P. respectively were developed by them, with a resultant speed of ship of 21 knots—it was found, while running the fifth half-hour, that salt water was finding its way into the boilers, owing to a valve having been left open by mistake, so the trial was again brought somewhat prematurely to an end. The final official trial was completed on the 7th November, in very rough weather. A continuous run of three hours' duration, under forced draught, was made with the following results:—With an air pressure of 1·7 in. in the stokeholds, a steam pressure of 193·6 lbs. per sq. in. was maintained in the boilers with easy firing; the starboard engines, with a vacuum of 27½ in., and the port, with a vacuum of 27 in., made 247 and 243 revolutions per minute respectively, and developed a total of 4,674·7 I.H.P., giving the ship, with a draught at the time of 7 ft. 6 in. forward and 11 ft. 9 in. aft, a speed of 20 knots in a heavy sea. Throughout the run the boilers showed no tendency to prime, and, had a greater fan power been used, it was evident from their working that they were capable of developing a much larger power.

The "Speedy" is of the same general dimensions as the other vessels of her class ordered to be built under the Naval Defence Act of 1889, her length being 230 ft. between perpendiculars, beam, 27 ft., and displacement at load draught of 8 ft. 9½ in., 810 tons. She has been fitted by her builders with triple-expansion twin-screw engines, to develop 4,500 I.H.P. under forced draught, and 2,500 under natural draught, the steam for which is generated in eight of Messrs. Thornycroft's patented water-tube boilers, the first of the kind fitted to any vessel in the British Navy, having a total heating surface of 14,720 sq. ft. and a grate surface of 204 sq. ft. The special feature in this type of boiler being the generation of steam from water contained within, instead of outside of, a number of tubes of comparatively small internal diameter, nearly the whole of the heat given off in the combustion of the fuel is absorbed by the tubes and utilized, and there is no unnecessary carriage of water within the boiler not required for steam-generating purposes, as in the ordinary marine or locomotive types of boilers usually fitted; the weight of the Thornycroft boilers fitted in the "Speedy," when full, being some 20 tons less than those of ordinary type fitted in gunboats of the same class. With this decrease in the weight of the boilers, there is, in the "Speedy," the further advantage of increased stoking space, and ample room for examining the tubes, although the boilers are eight in number instead of four, and are allowed only the same space in the ship as in other vessels of the same class and size. During the exhaustive trials the "Speedy" has undergone, the temperature of the stokeholds under natural draught—they are cooler under forced draught—has never exceeded 100°: accounted for by the fact that all the heat developed by the combustion of the fuel is absorbed by the steam-generating tubes of the boilers, and is prevented by their specially peculiar arrangement from passing to the outside and causing a radiation of heat therefrom into the stokeholds.

From the results attained on the trials of the vessel just concluded, the advantages claimed for the water-tube boilers fitted to her by the inventor have been fully realized, the following points having been specially brought out while they were under trial. The ease and rapidity with which steam can be raised to any pressure within the limit for which the boilers are constructed was shown in the short time required to raise it. The exemption from leakage was evidenced by the behaviour of the generating tubes under the extreme ranges of temperature and pressure to

which they were subjected; and from priming, by the energetic circulation of the boiler water, effected by the special arrangement of tubes adopted. There was, also, an entire absence of the ejection of either flames or unburnt fuel from the funnels, owing to the small amount of forced draught required and the large and effective heating surface causing nearly all the heat developed by combustion to be given off by the waste gases before they enter them.

The complete success of the above-recorded series of trials of the Thornycroft water-tube boiler, a success which all who witnessed them fully and highly appreciated, would seem to indicate that, when certain slight modifications of detail which have suggested themselves during the trials have been made in future boilers of the same type, we may look before long for a revolution in the art of fitting our war and commercial ships with steam generators.

Considering that the stoking in the "Speedy" during the recent trials was carried out by stokers from the Steam Reserve, who had had no previous experience with the boilers, the results attained must be considered eminently satisfactory. As a matter of fact, the stokers engaged in the trials not only found no difficulty in managing the boilers, but reported that it was much easier to fire them than either marine or locomotive boilers having an equal size of grate.

A Parliamentary paper gives the following description of the two 1st class battle-ships "Majestic" and "Magnificent," preparations for the building of which have at last been commenced at Portsmouth and Chatham, and for the commencement of which provision is made in the Navy Estimates of 1893–94. Their principal dimensions are as follows:—Length, 390 ft.; beam extreme, 75 ft.; mean draught, 27½ ft.; displacement, 14,500 tons. With natural draught on the eight hours' contractor's trial a mean speed of 16½ knots is anticipated; with moderate forced draught a maximum speed of 17¼ to 17½ knots will be obtained. The armament will include four 12-in. B.L. guns of new type, mounted in pairs in barbettes, two forward and two aft; 12 6-in. Q.F., 16 12-pr. Q.F., and 12 3-pr. Q.F. guns. There will also be five torpedo-discharges for 18-in. torpedoes, four of these being submerged. In the general disposition of the armament the arrangements of the "Royal Sovereign" class have been followed. There are, however, certain important differences. The 12-in. guns mounted in two strongly-armoured barbettes will have their mountings so arranged that they can be loaded in any position by manual power, while the proved advantages obtainable with hydraulic power and fixed loading stations will be retained. Strong armoured shields will also be fitted to the turntables and revolve with the guns. The protection of the 6-in. guns has been carried out more thoroughly than in the "Royal Sovereign" class, involving considerable additional weight. Two more 6-in. guns are carried in the new ships, and 12-pr. Q.F. guns have been adopted instead of 6-pr. as in the "Royal Sovereign." The total weight of protective material on the hull, including protection of 6-in. guns and protective deck, is greater than the corresponding weight in the "Royal Sovereign" class. Having regard to the improved qualities of armour now produced, and to the distribution and thicknesses of plating in the new ships, it is believed that they will possess unrivalled defence in close action, under existing conditions of attack or possible developments of high explosives and quick-firing guns. The "Majestic" and "Magnificent" have the same draught of water and extreme breadth as the "Royal Sovereign" class, but are 10 ft. longer, and carry their heavy guns forward about 4 ft. higher, having the freeboard correspondingly increased. They will be of practically the same speed, but in the new ships the coal-bunker capacity will be largely increased as compared with the "Royal Sovereign" class (which carry 900 tons), and provision is made in the design for filling up the whole space when desired. The new ships will, therefore, possess greater coal endurance, and be capable of keeping the sea for longer periods. Although the substitution of 12-in. for 13·5-in. guns has effected a considerable reduction in weight, the aggregate result of the changes above mentioned has involved a considerable addition to the load to be carried by the "Majestic" and "Magnificent." In order to obtain the qualities of offence, defence, and coal endurance which the Board consider essential in a 1st class battle-ship, having

regard to what is being done in other navies, it has been found necessary, therefore, to increase the length and displacement of the new ships as compared with the "Royal Sovereign" class. It is anticipated, however, that some of the changes made will tend to sensible economy in first cost, as compared with preceding vessels.

The 2nd class cruiser, "Hermione," a sister ship to the "Bonaventura," one of the improved "Latona" type, was launched at Devonport on the 7th November; and another vessel of the same class, the "Flora," was launched at Pembroke on the 21st.

The new torpedo-destroyer "Havoc" has been carrying out a series of trials in order to ascertain the consumption of coal when steaming at different rates of speed. Briefly, it may be said that a speed of 10 knots appears to afford the maximum of economy, that rate being obtained by the vessel with 3¼ cwt., while 5 cwt. produced only 11·2 knots. Put another way, at the lower rate of speed she could cover 57 knots per ton, and at the higher only 44·8; and, as regards the "Havoc" herself, she could, with her bunker capacity of 60 tons, steam at 10 knots for 3,500 miles without recoaling.

The Admiralty have issued their long-expected Minute on the "Victoria" disaster. While agreeing in the main with the verdict of the Court-Martial, they give it as their opinion that Admiral Markham was not justified in putting the interpretation upon Admiral's Tryon's signal which he did. They further blame Captain Johnstone severely, with regard to which there seems to be a pretty general opinion in the Service that he somewhat unfairly has been made a scapegoat. With regard to Mr. White's report on the "Victoria's" stability and the causes which led to the disaster, it is not regarded as by any means satisfactory outside Whitehall, and probably more will be heard about it. Mr. White and the Constructor's Department were, of course, on their defence, and he cannot be blamed for trying to prove that the ship was all she should have been, and that, if certain doors, &c., had been properly closed, she would have floated. He assumes, however, too much, and the attempt to throw the blame of the ship sinking on the executive officers of the ship is much resented. We hope to be able to call further attention to this important subject, especially as now the bulk of our Mediterranean Fleet consists of partially belted battle-ships with long weak unarmoured ends, a type of ship viewed with profound distrust by a large proportion of naval officers.

Austria-Hungary.—Some interesting trials of armour plates, extending over eight days, have lately taken place at Pola, in presence of Vice-Admiral Baron Spaun and a large number of naval and military officers. The trials were for the purpose of determining the armour for the three new ships, which are about to be built, and specimen plates had been sent by Messrs. Vickers and Cammell from England, by Krupp and Düllinger from Germany, and from the Austrian firm of Witkowitz. We have not as yet been able to obtain full details of the trials, but the trials resulted in favour of the Witkowitz firm, whose plate showed the best resisting power, all the others being more deeply penetrated by the projectiles, while Krupp's plate apparently broke up. ("Nautische Rundschau.")

France.—The following changes have taken place in the constitution of the Active Division of the Mediterranean Fleet. The 1st class battle-ship "Magenta," having completed her trials, has joined the squadron. The battle-ships "Courbet" and "Redoutable" have been withdrawn and placed in the 2nd category of the Reserve at Toulon, to undergo necessary repairs and have their armament of the new Q.F. guns fitted. The new torpilleurs-de-haute-mer "Corsaire" and "Mousquetaire," having arrived from Cherbourg, have taken the place of the "Dragon" and "Ouragan," which latter have been placed in the Reserve at Toulon. According to the new arrangement, the two vessels will form one unit, and be under the charge of a lieutenant-de-vaisseau, with a sufficient staff to keep them in order and ready

for mobilization. All the other torpilleurs-de-haute-mer will be similarly grouped. ("Le Yacht.")

The battle-ships "Hoche," "Dévastation," and "Amiral Baudin," the 1st class cruiser "Tage," the torpedo-cruisers "Faucon" and "Vautour," and the torpilleur-de-haute-mer "Coureur," all belonging to the Active Squadron of the Mediterranean Fleet, will have one-third of their crews disembarked for the winter months from the 1st January, 1894. The battle-ship "Colbert," the 3rd class cruiser "Forbin," and the torpilleur-de-haute-mer "Agile," belonging to the Reserve Squadron of the Mediterranean Fleet, will similarly have their crews reduced from the same date. ("Le Moniteur de la Flotte.")

The following vessels of the Northern Squadron were, in October, placed *en disponibilité* for the winter months, in accordance with the Decree of September, 1892. The battle-ship "Suffren," flag-ship of Vice-Admiral Brown de Colstoun, Commander-in-Chief of squadron; the coast-defence battle-ships "Fulminant" and "Furieux"; the torpedo-cruiser "Épervier"; the torpedo-aviso "Lance," and two torpedo-boats. They will leave harbour in the winter only to try their engines and for target practice. This measure has been dictated by economy, but the vessels can be mobilized, if necessary, within 24 hours. The Second or Active Division of the squadron consists of the "Victorieuse" battle-ship, flag-ship of Rear-Admiral Barrera, second in command of squadron; the coast-defence battle-ships "Requin" and "Tonnerre," the 3rd class barbette cruiser "Surcouf," the torpedo-aviso "Salve," and two torpedo-boats. ("Le Moniteur de la Flotte.")

The 1st class protected barbette cruiser "Isly," of which we give a drawing (Plate 34), has also been added to the squadron. She is a vessel of 4,160 tons displacement, 346 ft. long, with a beam of 43 ft. 6 in., and has engines of 8,100 I.H.P., with an estimated speed under forced draught of 19 knots. Her armament consists of four 6·5-in. Q.F. guns, in sponsons, two forward and two aft; six 5·6-in. Q.F. guns, one of which is mounted on the forecastle and one on the poop, the others on the broadside amidships; six 6-pr., and six smaller machine-guns, with four torpedo-tubes. She has a crew of 332 officers and men, and a coal stowage of 880 tons. With regard to her speed, however, it must be noted that during the summer manœuvres it did not at all come up to what was expected; and her armament of small Q.F. guns is much smaller than that provided for in the new 2nd class cruisers now building. ("Le Yacht.")

The following description of the new French battle-ship "Jauréguiberry" (Plate 34), launched from the yard of the Forges et Chantiers de la Méditerranée at La Seyne, near Toulon, on October 27th, is compiled from the "Mittheilungen aus dem Gebiete des Seewesens," and from "Engineering." It may be observed that she was launched with great ceremony, in the presence of President Carnot and Admiral Avelan and the officers of the Russian squadron then at Toulon. The ship is named after the distinguished Admiral, who died in 1887, and is almost identical with the "Charles Martel," launched at Brest in August last, and the "Lazare Carnot," which is still on the stocks; but although about the same tonnage, and with the same armament and armour protection, she is some 30 ft. shorter than the other two vessels. The plans were drawn by M. Lagane, the designer of the "Capitan Prat," the "Pelayo," and other well-known war-ships, and the vessel was laid down on November 23rd, 1891, and so was not quite two years upon the stocks; she embodies the latest and most perfect developments of ideas, which were first adopted for the "Pelayo," launched in 1886 for the Spanish Government, and which were improved upon in the "Capitan Prat," launched in 1890 for Chili. Her lines are very fine, and her forecastle is high out of the water, as is the case with all the new French battle-ships, except those designed for coast defence.

Her dimensions are as follows:—Length, 356 ft.; beam, 72 ft. 6 in.; and with a mean draught of 27 ft. 8 in. she displaces 11,824 tons. She will be fitted with two

triple-expansion engines, driving twin screws of manganese bronze, and steam will be supplied by 24 groups of the Allest and Lagrafel boilers. Her estimated speed with natural draught and 13,000 I.H.P. is 17 knots, and with forced draught and 14,200 I.H.P. 18 knots. The armament is arranged exactly as in the "Capitan Prat," the four big guns being disposed one forward, one aft, and one on each beam in covered turrets. The two forward and aft are each 11·8-in. 44-ton guns; those on the beam are on sponsons and are each 10·8-in. 34-ton guns. All the other guns are quick-firing ones. On either side, a little abaft the fore turret, and a little before the after one, is a small turret containing a pair of 5·4-in. 3-ton guns. In addition, there are four 6-pr. Q.F., twelve 3-pr., and eight 1-pr. Q.F. guns distributed on the upper deck and superstructure, and in the tops on the two military masts. There are also six torpedo-tubes, of which two are submerged.

The armour includes a 17·7-in. end-to-end belt of steel at the water-line, which is brought down forward to the point of the ram, and is surmounted by a belt of 3·9-in. armour, which protects the slope and edges of the armoured deck, which is of steel, 2·75 in. thick. The armour of the large turrets, which is 15·7 in. thick, is carried down to the protective deck; that of the small turrets for the 5·4-in. guns is 3·9 in. thick. All the eight turrets are constructed upon M. Lagane's balanced system, and no matter the direction in which they may be trained, the trim of the ship is in no way affected. This is an important improvement which might well be adopted in our own battle-ships. The entire armour of the "Jauréguiberry" will weigh nearly 4,000 tons, and will cost about 320,000*l.*; the coal capacity will be 800 tons, with stowage for a considerable amount in excess, when required. The complement will be 650 officers and men. A remarkable feature of the "Jauréguiberry" will be the extensive use of electricity as a motive power; the turrets, ammunition lifts, and many of the other auxiliary engines, usually worked by steam or hydraulic power, will be worked by electricity, which will also supply the current for 550 incandescent lamps and six powerful Mangin search lights. The total cost of the ship is estimated at 920,000*l.* In point of speed and armour protection, she is undoubtedly much superior to all our "Admiral" class, although only some 1,000 tons larger; and would probably be a match for the "Nile" and "Trafalgar," which, although about the same tonnage, have only partial belts and unarmoured ends. The armament of the "Jauréguiberry" is also so arranged that she can fire two 11·8-in., one 10·8-in., and four 5·4-in. guns simultaneously at any point on either beam, in addition to numerous small Q.F. guns, and can bring to bear upon any point ahead or astern one 11·8-in., two 10·8-in., and four 5·4-in. guns, besides smaller guns.

It is reported that the Commanders-in-Chief of the different squadrons have addressed an urgent remonstrance to the Minister of Marine on the subject of the new cruisers now being constructed. These officers point out that, although in the matter of protection and armament these ships will be capable of holding their own with vessels of similar classes in foreign navies, yet they fall far short in speed; England, Russia, Germany, and the United States are all in possession of cruisers capable of making from 19·5 knots to 22 knots, while the extreme speed contracted for in the new French vessels continues to stand at only 19 knots. ("Le Petit Var.")

Italy.—The "Re Umberto," one of the largest of the new battle-ships for the Italian navy, went out on the 25th October for the official trials, and the final acceptance of the machinery from the makers, Messrs. Maudslay, Sons, and Field, of London. The trials proved of a highly satisfactory character. The contract stipulated for the development of 15,200 I.H.P. natural draught, and 19,500 I.H.P. forced draught, but the Government, as hereafter shown, decided to abandon the forced draught trials. The run was made from Spezia to Genoa and back, a distance of 120 knots, at an average speed of 18·3 knots, the engines indicating a mean of about 17,000 H.P. with ¼ in. air pressure in the stokeholds. The maximum power during the run was found to be 19,000 H.P., and the maximum speed 18½ knots, which was obtained by only ¼ in. of air pressure. The machinery worked smoothly in every respect, no water service being used. The boilers gave a plentiful supply of steam without priming or other difficulties. The results were

considered so satisfactory from every point of view, both as regards the speed of the vessel and the facility with which the speed could be maintained (the trial being made by the ordinary ship's crew of stokers, and not by picked men), that the Commission appointed recommended the Ministry of Marine to accept the machinery without further trials, as it appeared so obvious that the I.H.P. with forced draught would largely exceed the contract power of 19,500. The recommendation was therefore accepted by the Minister of Marine. This powerful ironclad is similar to the "Sardegna," plans of which we gave in the May number. She is 400 ft. long, has a beam of 76 ft. 9 in., and with a draught of 28 ft. 6 in. she has a displacement of 13,375 tons. Protection is afforded by side armour extending from 3 ft. 3 in. below the water line to the upper deck; the armour is not, however, carried the whole way round the ship, but at the water-line, and for 3 ft. 3 in. above and below, extends for a length of 234 ft. Above this again, up to the upper deck, the armour covers the side for 215 ft.; the thickness of the plating, however, is only 4 in.; at each end of the belt are 3-in. armour bulkheads rising from the armoured to the upper deck; there is, in addition, an armoured deck with a maximum thickness of 4 in. There are two barbettes, one forward and one aft, protected with 18-in. armour, while the ammunition tubes, conning tower, &c., have 12-in. plating. Her armament consists of four 67-ton, eight 6-in. Q.F., 16 4·7-in. Q.F., and 31 smaller Q.F. guns, with eight torpedo-tubes. She has a coal stowage of 1,200 tons.

The new protected cruiser "Etruria" has also completed her trials. She is 2,280 tons, 262 ft. 6 in. long, 39 ft. 6 in. beam, and has engines of 6,500 I.H.P.; the contract speed was 19 knots, but the ship averaged nearly 20 knots during her six hours' run.

The Permanent and Reserve Squadrons have been reconstituted since the conclusion of the manœuvres. The Permanent Squadron, under the command of Vice-Admiral the Duke of Genoa, now consists of:—

1st Division.—Battle-ship "Lepanto," flag of Commander-in-Chief.
2nd class protected cruiser: "Stromboli."
Torpedo-cruiser: "Euridice."
Torpedo-aviso: "Avoltoio," and the
Cistern-ship: "Tevere."

2nd Division.—Battle-ship: "Italia," flag of Rear-Admiral Corsi.
2nd class protected cruiser: "Piemonte."
Torpedo-cruiser: "Iride," and the
Torpedo-aviso: "Nibbio."

3rd Division.—Battle-ship: "Dandolo," flag of Rear-Admiral Gonzales.
2nd class protected cruiser "Vesuvio."
Torpedo-cruiser: "Monzambano," and the
Torpedo-aviso: "Sparviero."

All three divisions have a small flotilla of torpedo-boats attached to them.

The Reserve Squadron, under the command of Vice-Admiral Accini, has been reconstituted into two divisions from the 21st November:—

1st Division.—Battle-ships: "Re Umberto," flag, "Duilio."
Torpedo-cruiser: "Aretusa."

2nd Division.—Battle-ships: "Morosini," flag of Rear-Admiral Puliga, "Andréa Doria."
2nd class protected cruiser: "Etruria."

The battle-ship "Ruggiero di Lauria" and the torpedo-cruisers "Minerva," "Urania," and "Montebello" were placed from the same date *en disponibilité* at Tarento, Naples, and Spezia.

In addition, Reserve torpedo flotillas have been constituted at Spezia, with the torpedo-aviso "Aquila," at Maddalena, Leghorn, Naples, Taranto, Gaëta, Messina,

and Venice. The two first are commanded by captains, and the remainder by commanders. ("Italia Militare e Marina.")

United States.—In the middle of September was launched from the yard of Messrs. Cramp, at Philadelphia, the triple-screw protected cruiser "Minneapolis," a sister ship to the "Columbia," which has lately been undergoing her trials with remarkable success. Intended to serve as a "commerce destroyer," she is a steel, four-funnelled vessel, remarkable alike for size, speed, and armament. Her chief dimensions are as follows:—Length on load line, 412 ft.; extreme beam, 58 ft. 2 in.; mean normal draught, 23 ft.; displacement, 7,500 tons; I.H.P., 21,000; speed under forced draught, 22 knots; coal capacity with normal draught, 1,200 tons; maximum coal capacity, 2,200 tons; radius of action at 10 knots, 26,240 miles; guaranteed sea speed, 21 knots. The magazines, engine-rooms, and vitals are protected by an over-all steel deck, varying from 2½ in. to 4 in. thick. One screw is immediately before the rudder, on the centre line of the ship, and is a four-bladed screw, of 10° more pitch than the two others, which are placed one on each quarter, 15 ft. forward of the middle screw, and 4 ft. 6 in. above it. These are triple-bladed. Each screw has independent triple-expansion vertical inverted engines. With the middle screw alone a speed of 15 knots can be attained; with the quarter screws alone, a speed of nearly 19 knots. The cylinders are of 42 in., 59 in., and 92 in. diameter for high, intermediate, and low pressure respectively, and 42 in. stroke. The engines are in three separate watertight compartments, the two driving the counter-screws being placed abreast, the same as in twin-screw ships, and the one driving the centre shaft just abaft them, and lapping each for one-half its width. Steam is supplied by eight main boilers, placed in four separate compartments, and carrying 160 lbs. per square inch as their working pressure. They are double-ended, 21 ft. 3 in. long, and 11 ft. 8 in. in diameter, with eight 42-in. corrugated furnace flues, and 1,128 steel 2½-in. tubes. The total heating surface is 43,269 sq. ft., and the total grate surface 1,285 sq. ft. The estimated number of revolutions for extreme speed is 129 a minute. The armament, in addition to six torpedo-ejectors, is to be composed of one 8-in. 15-ton 250-pr. R.B.L., two 6-in. 6-ton 100-pr. R.B.L., twelve 4-in. 1·5-ton 33-pr. Q.F.; sixteen 2·24-in. 8-cwt. 6-pr. Q.F., eight 1·46-in. 73-lb. 1-pr. Q.F., and four Gatling machine-guns. The 8-in. gun will be mounted as a chaser; the 6-in. guns will also be mounted one on each bow; the 4-in. guns will constitute the broadside armament. The 8-in. and 6-in. guns will have heavy steel shields attached to their mountings, and in wake of the remaining guns will be 4-in. and 2-in. nickel-steel plates. The sub-divisions of the vessel, which is furnished with a ram, are so arranged as to form a complete double hull below the water-line.

Commenting upon the launch of this ship, the "New York Tribune" says:—"This remarkable ship, while closely resembling its sister ship the 'Columbia,' is likely to prove faster, since the builders have profited by experience in building the first vessel. These ships are 'commerce destroyers' pure and simple. In their lines and general appearance they look like innocent merchant steamers, their warlike character being ingeniously concealed. They are designed to be able to overtake any ship afloat. Their coal endurance will enable them to keep the seas for 109 days at 10 knots speed, and steam for a week at the 'Campania's' maximum rate. If they fulfil the expectations, not, perhaps, of the department designers, but of the builders, they will be able to make 22·12 knots, and to maintain this speed for a week. A performance of that kind will establish their claim to be the fastest ships afloat. And they will be a most formidable addition to the American Navy, since they will menace by their speed and coal-endurance the commerce of any hostile Power. At the same time, they are serviceable vessels for times of peace, since the third screw ensures economy in the maintenance of ordinary speed, and they are spacious and comfortable for officers and men." *À propos* of the above remarks, we are able to give an account of the "Columbia's" official forced-draught trial trip, which has been carried out with remarkable success:—"The official trial of the 'Columbia' took place on November 18. The course was almost directly north from a point off Cape Ann (Massachusetts), a distance of 43·96 nautical miles, the vessel crossing the line at full speed, making a long

turn, and taking another run over the course in the opposite direction. The times of passage over the course alone were taken, the time of turning being eliminated, but during the turn no change in engines or boilers was permitted and not a valve or link touched. Buoys were placed along the course to mark the different stations, and vessels were anchored near each buoy.

"The starting line was crossed at 9.54.40, and at 11.49.48 the ship dashed across the finish line, completing the first half of the trial, the average speed having been 22·92 knots. During the run the steam pressure had risen to 158 lbs., and revolutions 136 each on the twin screws and 131 on the mid-ship screw, and the last 7 miles were said to have been made at the rate of 25·3 knots an hour.

"After turning a circle of about 4 miles in diameter the run back was commenced, the line being crossed at 12.14.58 with a steam pressure of 160 lbs., the twin screws making 136 revolutions each and the mid-ship screw 130.

"During the backward run there was some priming of the boilers at one time, and the speed between two of the stations on the course dropped to the rate of 21·11 knots, but the total backward run was made at the average rate of 22·71 knots. The mean of the two runs was therefore figured as 22·81, and the builders have earned a premium of 350,000 dols. for attaining a speed of $1\frac{3}{4}$ knots over the contract, which was 21 knots, as they obtain 50,000 dols. for every quarter knot the vessel makes over the contract speed. The Board conducting the trial, of which Rear-Admiral Belknap is president, expressed their highest satisfaction with the performance of the vessel throughout.

"The 'Columbia' is identical in every respect with the 'Minneapolis,' which we have described above. She has been in a special degree the work of Engineer-in-Chief G. W. Melville, U.S.N., head of the Bureau of Steam Engineering, under whose directions the designing of her machinery was done. He decided in favour of having three screws, as he considered that twin-screw engines, on account of their size and the fact that they would be very extravagant in the use of steam at the ordinary cruising speed, would not answer the purpose satisfactorily, and, moreover, that the space that could be given up to the machinery was restricted and would not contain twin-screw engines of the size required.

"The 'Columbia' is built as a commerce destroyer, and, in our opinion, the trial, though satisfactory as far as it goes, should be carried further. The vessel should be commissioned and coaled under ordinary conditions of quality of fuel, and her trial course should be the same as that of the Cunard steamers or of the German line, that is, a course of about 3,000 nautical miles across the ocean. Then we should establish her true rating, and the trial would show whether she could compete in war with the 'Campania,' 'Lucania,' the 'Fürst Bismarck,' or the 'Paris.' In the present system of trial trips everything is subordinated to making the highest possible speed over the short course of 40 or 50 miles." ("Scientific American.")

The naval authorities are experiencing difficulty in preparing the Harveyized armour-plates for use. Although the Harvey plate has beaten all others, as is generally conceded, it is a question whether the plates can be successfully fastened to vessels without impairing their high efficiency. The Harveyized plates are so much superior in hardness to plain and nickel-steel plates, that the tools used heretofore are useless. The armour for the "Maine" has recently been supplied by the Bethlehem Company, but the constructors have not as yet discovered any feasible method of fastening on the armour without cutting out spaces and drilling to fasten the plates to the side. With the Harveyized plates the tools will only do the cutting after the steel has been softened. It is believed that this local softening of the steel will weaken it, so that its qualities will be reduced to those of nickel plate. Another point is also brought forward. The late Mr. Harvey received 96,000 dollars for the right to use his process, and the Naval Department is also paying a royalty of one cent a pound for all Harveyized plates, so that the new armour-plate is already very expensive, and will be doubly so if certain parts require to be re-treated. The matter is being investigated, and it is hoped that some method will be devised for putting on the armour-plates without the necessity of an expensive operation which doubtless injures the value

of the plate. It is believed that the difficulty will be met by bolts being driven from the interior of the frame into the backs of the plates, and that in barbette construction the Harveyized surface will be omitted from a narrow rim at top and bottom of the plates where it is necessary to drive bolts through. ("Scientific American.")

A new and radical departure has been made in the new rifle for the Navy, which has been approved by the Secretary of the Navy. The calibre of the new weapon is 0·234 in. This is the smallest calibre regularly adopted by any Government. The calibre of the French Lebel is 0·315; the German Mannlicher is 0·311; the Danish Krag-Jorgensen is 0·315; the English Lee-Speedy is 0·303; the Swiss Schmidt is 0·295; and the United States Army model 0·30. The Ordnance Board recommend the 0·234 calibre, as they consider it will give higher velocity, greater range, greater penetration, and greater accuracy than the 0·30, with the added advantage of allowing the men to carry a greater supply of ammunition. The disadvantage is the lack of interchangeability of ammunition between the two services. The figures given above for the rifles adopted by foreign nations are the latest. In the last few years the reduction in calibre has been phenomenal. The English Martini and the old Springfield rifles were 0·45; the famous French Chassepôt, 0·433, and the Russian Berdan, 0·42. The barrels of the new rifles will be made of nickel-steel alloy. ("Scientific American.")

MILITARY.

Australian Colonies. Victoria.—Major F. Rainsford-Hannay, R.E., Commanding Engineer Colonial Forces, Victoria, has been good enough to send the following communication:—

"In view of the reception accorded to the Victorian Horse Artillery, who competed some months ago at the Military Tournament at Islington, it may interest readers of the 'Royal United Service Institution Journal' to hear something of other branches of the Victorian Defence Force.

"In illustration of the system of instruction followed, I can hardly do better than detail the work carried out by metropolitan corps on the Prince of Wales's birthday, 9th November, 1892.

"Artillery, engineers, and infantry are all annually put through their special courses of instruction in gunnery, field engineering, submarine mining, musketry, and battle firing, but whenever a whole day can be obtained special efforts are made to give tactical and battle firing practice, as far as possible under service conditions.

"On the day in question, the parade state was as follows:—

Horse and Field Artillery, strength, 254, with 158 horses, 21 guns.							
1st Victorian Regiment,	„	573	„	3	„		
2nd „ „	„	556	„	5	„		
Ambulance	„	28	„	3	„	2	wagons.
Comt. and Transport Corps	„	6	„	2	„	1	„

"All corps paraded early at their various drill grounds in Melbourne, marched to the railway station, and were entrained in specials for Lancefield Junction, a distance of 31 miles, the ordinary railway traffic going on as usual.

"A position, unknown to the attacking troops, had previously been prepared on Fenton's Hill, about 3 miles from the railway station. This position consisted of a single line of shelter trench, about 400 yds. long, with 'head and shoulders' targets at intervals of one pace. The trench was almost invisible to the attack until the time arrived for the defence to open fire, and this was represented by powder hose and small charges fired electrically by men in pits on either flank.

"Two separate attacks were carried out, 1st, by artillery, 2nd, by infantry.

"The artillery opened fire at upwards of 3,000 yds., taking rather long to find the

range, the soft nature of the ground making it difficult to observe results. They subsequently occupied two other positions at ranges of 2,000 and 1,400 yds.

"189 shrapnel were fired, resulting in 226 hits, representing 131 men disabled (69·31 per cent.).

"Targets were then checked and repaired, and the infantry advanced to attack as a brigade in the 1st line, 3rd zone. Fire was opened at 800 yds., and 18,700 rounds were fired, resulting in 1,164 hits on the dummies (6·28 per cent.).

"The ground was very wet and rough, with numerous pools of water; moreover, it rained heavily during the attack, and there was a high wind.

"Special trains were provided for the return journey, and the troops all reached their homes before dark."

Austria-Hungary.—It is stated in the "Revue du Cercle Militaire" that, after two years' trial, it has been decided to adopt the machine-gun invented by the Archduke Karl Salvator and Major von Dormus, of the artillery. The gun is primarily intended for use in fortresses, but can be equally well employed in the field. A short description of the peculiarities of the gun is given in No. 46 of the journal quoted. The barrel is said to be of the same calibre as the Mannlicher rifle.

The formality of swearing fidelity to the colours, which was abolished some years ago, has lately been revived, and has now to be observed by all recruits on joining their corps. The ceremony brings into strong relief the number of nationalities represented and languages spoken in the Austro-Hungarian Empire. In describing the operation in one of the Viennese barracks, the "Reichswehr" reports that the formula of oath had to be repeated in succession, first, by the military chaplain in German, and then by two captains in Hungarian and Slovak. In other barracks the oath had to be administered in Bohemian, Italian, Roumanian, Serbo-Croatian (for the Mussulman recruits of Bosnia-Herzegovina), and Polish (for the recruits from Galicia).

France.—According to "Le Progrès Militaire," elementary musketry instruction is, in future, to form a regular part of the school instruction of those pupils of the public primary schools who have passed their tenth year, and are attending the intermediate or upper classes. The weapon to be used is the Flobert carbine, and the instruction is to be imparted exclusively by the school teachers.

During the recent autumn manœuvres, two distinct battle formations were thoroughly tested in the 3rd and 7th Army Corps respectively. In the 3rd Corps the regiment was disposed in three lines, the foremost of which was formed by a battalion in extended order, while each of the other two consisted of a battalion in line of columns. In the 7th Army Corps the companies were extended in checkered formation, each in single rank, covered by a chain of skirmishers, and they formed company columns during the advance. According to "La France Militaire" there is but one opinion, that the formation adopted in the 7th Corps is better than that assumed in the 3rd Corps, so far as concerns the advance and reinforcement of the firing line; but, while the disposition practised by the 3rd Corps has its disadvantages in the preparatory engagement, it greatly increases the force of the attack.

An interesting feature in the manœuvres of the Paris garrison, which were held at Wissous on the 4th and 5th November, was that General Saussier, the Governor of Paris, had authorized the officers of the Reserve and Territorial Army, residing in Paris and the suburbs, to take part in the exercises, either in positions of command corresponding to their rank or as spectators. For the benefit of those who could not be provided with commands, a specially qualified staff officer was detailed to conduct them and to explain and criticise the positions occupied by the troops and the various phases of the manœuvres. The "Spectateur Militaire," in commenting on this new feature in the conduct of manœuvres, after observing that the officers

who had the benefit of this instruction probably gained more practical insight into the details of the operations than those who had actual commands, remarks, "We go much further, and maintain that it would be in the highest degree advantageous if, from time to time, this mode of instruction were extended to the officers of the Active Army of all ranks up to that of battalion commander inclusive."

Germany.—It has been decided to establish two under-officers' preparatory schools in Bavaria, conducted on the Prussian system, and to subsequently form two under-officers' schools. A short account of the object of these schools was given in last month's Notes. They have existed in Prussia from an early period, and there has been a Saxon under-officers' school at Marienburg for many years. The Baden under-officers' school at Ettlingen was taken over by Prussia some 20 years ago. ("Allg. Mil.-Zeitung.")

The Military Budget for 1894–95 contains an important item for the provision of bicycles, which are to be introduced in the proportion of two per battalion. The result of the employment of cyclists at the recent manœuvres has been very satisfactory, and regulations are to be issued on the subject.

The price of the bicycles adopted for the army is estimated at about 15*l.* each, and the Budget contains a credit of 218,400 marks (10,920*l.*) for their purchase. ("Rev. du Cercle Mil.")

The War Budget for 1894–95 shows an increase of 31,000,000 marks (1,550,000*l.*) under the head of permanent expenditure, which amounts to 480,000,000 marks (24,000,000*l.*), including the Bavarian Budget. The ordinary non-permanent expenditure is estimated at 2,700,000 marks (135,000*l.*) less than in the last financial year, and the extraordinary non-permanent expenditure (which is not charged to current revenue, but covered by loans) is 51,000,000 marks (2,550,000*l.*) less. The budgetary effective of the German army for 1894–95 is placed at 22,534 officers, 77,883 under-officers, 479,229 soldiers, 2,069 medical officers, 1,102 paymasters, 578 veterinary surgeons, 1,060 armourers and controllers of arms, 93 saddlers, and 96,844 troop horses.

The ordinary Naval Estimate is 51,369,000 marks (2,568,450*l.*), being an increase of 3,116,000 (155,800*l.*) on that of the last financial year. ("Rev. du Cercle Mil.")

Italy.—The course at the War Academy (Scuola di Guerra) has been extended from two to three years. Officers who succeed in obtaining the diploma at the end of the three years' course of instruction have exceptional advantages in the way of promotion, being entitled to advancement to the rank of major as soon as they arrive at the senior sixth of the list of captains. The qualification for the certificate depends upon the mean of the marks gained by the students at the yearly examinations and at the final. ("L'Esercito Italiano.")

Russia.—It is stated in the "Invalide Russe" that a sapper detachment, consisting of 2 officers and 16 men, is to be at once formed in every cavalry regiment. The officers are to be selected from among those who have qualified in field fortification and telegraph duties during a three months' course with the Sapper Brigade. For the instruction of the men, sapper schools with a one year's course are to be established, to which 20 men from each regiment will be attached, such men to be able to read and write, and, if possible, to have been already employed at railway and telegraph stations. These proposed sapper detachments will, in time of war, be utilized for destroying bridges, railways, and telegraphic communications, tapping telegraph wires, &c.

During the recent encampment at Tschugujev, experiments were made in order to ascertain how the troops could best be provided with hot meals during the march. When the food was cooked in the company kettle, after arriving in bivouac, the men had frequently to wait four or five hours before they could have their meal; and when they cooked each for himself the food was ready to eat in from two to two

and a half hours, but was much less palatable. The employment of the so-called "Turkestan kitchen" gave the best results. In this case the meal was cooked by the company cooks, before the march began, in a large kettle or cauldron, which was carried on two wheels, and drawn by a single horse. In order to keep the food hot, the kettle was covered with thick felt. In this way the meals could be served hot immediately after the troops arrived in bivouac. ("Invalide Russe.")

The Pigeon Section of the Acclimation Society for Animals and Plants recently proposed to the Staff of the Moscow Military District that use might be made of the section for military purposes. According to the "Invalide Russe," the Society was given to understand that an opportunity might be given to the pigeon section to take part in the grand manœuvres of 1894, when carrier pigeons will probably be employed to convey despatches from Smolensk to Moscow. The Society was recommended to train pigeons to convey messages for considerable distances, up to 650 miles, and to establish stations between the western frontier and Moscow.

The existing frontier guards have been formed into a special frontier guard corps, which is placed under the immediate control of the Minister of Finance. This corps has a complete military staff, and the inspector of the frontier guard, Lieutenant-General Swinin, is now styled commander of the Frontier Guard Corps. The Baltic Frontier Cruiser Flotilla is also under his orders. Up to the present time the frontier guards were organized as required to meet the exigencies of the several frontier districts, and their special duty was to prevent smuggling; but, under the new organization, the frontier troops actually come into the general "ordre de bataille," and frontier guard detachments thus become part and parcel of the army corps. Hitherto there were nine frontier districts, grouped into 28 brigades in all; but now divisions are formed, as in the army, which represents an additional strengthening of the Russian army on the western frontier. The special object of the reorganization of the frontier troops is, apparently, to ensure an efficient surveillance of the frontiers of the Empire; so that, in case of war, the process of mobilization may be well protected. ("Allg. Mil.-Zeitung.")

Important steps have lately been taken to perfect the preparation of the reserve troops for war. At the present moment Russia has, ready formed, the complete staffs for 24 reserve infantry divisions; 9 of the reserve infantry brigades (which in war at once become divisions) consist of 4 regiments each, the regiments being 1,500 strong, and formed in 2 battalions; each of the other 15 brigades consists of 4 battalions each. In time of war each of the 24 brigades (20 European and 4 Caucasian) is designed to develop into a division comprising 4 regiments of 4 battalions each. In addition to this, each of the regiments or battalions above mentioned, in time of war, is to form a fifth battalion to be used as garrison troops. ("Deutsche Heeres-Zeitung.")

Switzerland.—According to the "Allg. Mil.-Zeitung," a project for the reorganization of the army has lately been prepared by the Military Department, which will, shortly, be submitted to the Federal Assembly. Among other important proposals is the increase of the field artillery from 48 to 56 batteries, and the creation of four new mountain batteries.

United States.—The Hotchkiss Ordnance Company has constructed a 2-pr. quick-firing gun for street-fighting for the use of the National Guard, which is said to possess the following advantages:—In all ordinary cases, it will render the use of field artillery unnecessary, and so save time and expense; it combines the effect of the mitrailleuse with that of the field gun, and is superior to both for use against the mob, since it can either sweep the streets with small cartridges or be employed to demolish barricades or buildings with quick-fired shell; four men can work the gun without having had any technical instruction or experience; the moral and physical force of dismounted troops in street-warfare is considered to be doubled by the employment of the gun. ("Army and Navy Journal.")

FOREIGN PERIODICALS.

MILITARY.

Militär-Wochenblatt.—No. 96. "General Review of the Imperial Manœuvres in Alsace-Lorraine" (with two sketches) (*continued*). "Sapper Detachments in the Cavalry Regiments stationed in the Military Districts of Wilna and Warsaw." "Soldiers' Wills." No. 97. "Manœuvre Reflections of a Field Artilleryman." "The French Manœuvres of 1893. The Opinion of a French Officer" (*à propos* of the articles in the "Revue du Cercle Militaire"). "The Employment of Machine Guns in the Swiss Cavalry." "Soldiers' Wills" (*continued*). "The New Organization of the Spanish Army." No. 98. "The French Manœuvres of 1893" (*concluded*). "Soldiers' Wills" (*concluded*). No. 99. "General Review of the Imperial Manœuvres in Alsace-Lorraine" (with two sketches) (*concluded*). "The New Firing Ranges (Maisons-Laffitte) near Paris." No. 100. "Review of F. Hoenig's 'Der Volkskrieg an der Loire.'" "The Infantry in the Manœuvres of 1893." No. 101. "The Extent of Front of Army Corps, &c., in the War of 1870-71" (with a sketch map). "The New Regulations for the Higher Staffs in the French Army." "The French Reserve Regiments." No. 102. "The Extent of Front of Army Corps, &c." (*continued*). "The Great Cavalry Manœuvres of 1893 in the Military District of Warsaw." No. 103. "The Extent of Front of Army Corps, &c." (*continued*). "Further Remarks on the Foundering of H.M.S. 'Victoria'" (*à propos* of the decision of the Admiralty and Mr. White's Report). No. 104. "Thoughts on the Employment of Troops during Manœuvres." "The Extent of Front in the War of 1870-71" (*continued*). "Garrison Exercises of French Reserve Officers."

Beiheft zum Militär-Wochenblatt.—Heft 11. "Charleston, 1860—1865" (with two plans).

Neue Militärische Blätter.—November. "Colonel de Ponchalon's 'Souvenirs de Guerre' (1870—1871)" (*continued*). "The Battle Regulations of the Russian Army." "In a Snow-storm. Recollections of the Herzegovina in 1882" (*concluded*). "General Skobelev and the Moral Element" (*continued*). "Modern Cruisers and their Employment in Naval Warfare on a Large Scale—The English Cruiser Fleet" (*continued*). "A Sketch of the Battle of Lübeck" (*continued*).

Jahrbücher für die Deutsche Armee und Marine.—October. "The Reform of the Engineer Service of the Austro-Hungarian Army." "The French Military System since 1889" (*continued*). "The Italian Army in the First Half of 1893." "Our 'more intensified' Training, and French Views as to the Necessities of the French Army." "La Frontière" (*à propos* of Eugène Ténot's Work). "The Present Organization of the Red Cross Society in Prussia and Germany." "Snow-shoeing and its Employment for Military Purposes."

Journal des Sciences Militaires.—November. "The Battle of the Vesles" (*continued*). "Small-calibre Rifles—Arms on Trial and under Construction." "The Meaning of Victory, as conceived by the Great Generals" (*continued*). "The Campaign of 1814" (*continued*). "The Captain" (his position and important duties). "Cryptography" (*continued*). "Food for the Army." "The English Campaign in the Soudan, 1884-85" (*continued*).

Revue Militaire de l'Étranger.—November. "The New German Regulations for Field Fortification." "The Servian Army in 1893" (*continued*). "The British Navy and the Budget of 1893-94."

Spectateur Militaire.—1st November. "The French Infantry Drill Regulations of 1889; what they prescribe, forbid, and permit" (*continued*). "The Capture of

Sfax; July, 1881." "A Year's Column Work in Algeria" (*concluded*). "Souvenirs and Lessons from History" (*continued*). 15th November. "Notes on the Russian Army. The Officers." "The French Infantry Drill Regulations, &c." (*continued*). "The Capture of Sfax" (*continued*). "Souvenirs and Lessons from History" (*continued*).

Revue du Cercle Militaire.—No. 45. "The Exercises of the Medical Service of the Government of Paris." "The Irregular Troops of the Chinese Army." No. 46. "The Recent Instructional Manœuvres for Officers of the Reserve and Territorial Army." No. 47. "Spain and Morocco" (with a map of Melilla and surrounding country). "The Problem of Mounted Infantry resolved by the Employment of the Bicycle" (*continued*). No. 48. "The Incorporation in Time of Peace of Men who are not then called upon to serve owing to their being only fit for Employment in the Auxiliary Services" (a proposal for increasing the peace effective of the first line—active and reserve). "The Irregular Troops of the Chinese Army" (*concluded*). "The Problem of Mounted Infantry resolved, &c." (*continued*).

Revue du Service de l'Intendance Militaire.—September—October. "The Administration of the Austro-Hungarian Army" (*continued*).

Revue Militaire Suisse.—November. "Military Cycling; its Rôle and Employment." "The Miniature Krnka Rifle." "The Time kept by the French and Germans in 1870."

NOTICES OF BOOKS.

Les Armes à Feu Portatives des Armées Actuelles et leurs Munitions. Par un Officier Supérieur. With 131 Figures and Plates. Paris: Baudoin, 1894. 6 fr.

This is an excellent book. It gives a general history of fire-arms and repeating rifles; the requisites of rifles in general, and of repeating weapons; general details of the various component parts; detailed descriptions, with illustrations, of the present service weapons (rifles, carbines, and revolvers) of all countries, and of some of the more recent experimental arms. A chapter is devoted to smokeless powders for small-arms, and to the supply of ammunition in the field. The book also contains good tables of past and present military small-arms.—F. L. N.

List of Recent Foreign Books (Military).

Hoche et la Lutte pour l'Alsace (1793—1794). By A. Chuquet. Paris: Cerf, 1893. 3 fr. 50 c.

Campagne du Maréchal Soult dans les Pyrénées Occidentales en 1813—1814. By Commandant Clerc. Paris: Baudoin, 1894. 9 fr.

Stratégie de Marche. By General Lewal. Paris: Baudoin, 1893. 5 fr.

La Cavalerie Française de 1800 *à* 1815. By L. de Jaquier. Paris: Lavauzelle, 1894. 2 fr. 50 c.

La Turquie Officielle. Constantinople. Son Gouvernement, ses Habitants, son Présent et son Avenir. By Paul de Régla. 4th Edition. Paris: May et Motteroz, 1891. 3 fr. 50 c.

Les "Mavroyéni," Essai d'Histoire Additionnelle à l'Histoire Moderne de la Grèce, de la Turquie et de la Roumanie. By Th. Blancard. Paris: Flammarion, 1893. (914 pp.) 25 fr.

Elf Jahre Balkan. Erinnerungen eines Preussischen Offiziers aus den Jahren 1876 *bis* 1887. (*Serbien* 1876–77, *Türkei* 1877–78, *Ostrumelien* 1879–85, *Bulgarien* 1885–87). Breslau: Kern, 1889. 10 mks.

Unter Nikolaus I und Friedrich Wilhelm IV. Briefe und Tagebuchblätter aus den Jahren 1834—1857. By T. VON BERNHARDI. Leipzig: Hirzel, 1893. 7 mks.

Der Preussische Feldzug in den Niederlanden im Jahre 1787. By Captain SENCKLER. With Map. Berlin: Felix, 1893. 1 mk. 50.

Die Grosse Reiterschlacht bei Brandy Station, 9 *Juni,* 1873. By H. VON BORCKE (then Chief of the Staff to General Stuart) and J. SCHEIBERT (then Captain). With 6 Portraits, 5 Maps, &c. Berlin: Kittel, 1893. 7 mks. 50.

Gefechtsbilder aus dem Kriege 1870–71. *Band II. Die Gefechte von Bois-commun und Lorcy am* 24 *und* 26 *Nov.* 1870. By FRITZ HOENIG. With 2 Plans. Berlin: Felix, 1893. 2 mks. 40.

Der Volkskrieg an der Loire im Herbst 1870. By FRITZ HOENIG. Vol. ii. With a Map and 5 Sketches. Berlin: Mittler, 1893. 8 mks. 50.
(The first volume was noted in the May number of the Journal.)

Der Krieg von 1806 *und* 1807. By Colonel O. VON LETTOW-VORBECK. Vol. iii. "The Campaign in Poland." With General Map and 8 Sketches. Berlin: Mittler, 1893. 5 mks. 50.
(Vols. i and ii were noted in the March number of the Journal.)

Die Schlacht von Loigny-Poupry am 2 *Dezember,* 1870. By Major KUNZ. With a Map. Berlin: Mittler, 1893. 4 mks. 50.

Die Stellung des Subaltern-Officiers in der Compagnie und sein Einfluss auf die Erziehung des Soldaten. By Captain K. F. VON FELSENBRUNN. Vienna: Seidel, 1893. 1 mk.

Die Schule der Führung für Officiere der Fusstruppen. With Plans illustrating minor tactical operations. By Field-Marshal-Lieutenant A. HAUSCHKA. Vienna: Seidel, 1893. 4 mks.

Das Artillerie-Schiessspiel. Anleitung zum applikatorischen Studium der Schiessvorschrift und zur Bildung von Schiessbeispielen. By Major-General ROHNE. 2nd Edition. Berlin: Mittler, 1893. 2 mks. 50.

Beitrag zur theoretischen und praktischen Ausbildung der Kavallerie im Felddienst. By Captain JUNK. 2nd Edition, with Map. Berlin: Eisenschmidt, 1893. 2 mks. 40.

Unsere heutige Infanterie-Taktik im Spiegel der Augustkämpfe um Metz. By General VON SCHERFF. Berlin: Felix, 1893. 7 mks. 50.

1160 *Themata für Winterarbeiten und Vorträge aus dem Gebiete der neueren Kriegsgeschichte nebst Angabe der Quellen.* By Major H. KUNZ. Revised to date. Berlin: Felix, 1893. 2 mks. 40.

Valuable on account of the very full list of authorities on the principal wars from 1831 to 1891.

Fire Manœuvres of Artillery Masses, and the Instruction to be drawn therefrom; an article contributed to the "Revue d'Artillerie" for November, 1892, by Lieut.-Colonel CHADON, 2nd Regiment of French Artillery (officially designated to attend the artillery mass manœuvres at Châlons, in August, 1892).

An English translation of this interesting paper is published in the "Journal of the United States Artillery" for October, 1893.

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LONDON
HARRISON AND SONS, PRINTERS IN ORDINARY TO HER MAJESTY,
ST. MARTIN'S LANE, W.C.

PROCEEDINGS

OF THE

Sixty-third Anniversary Meeting,

ON MARCH 3RD, 1894,

WITH

ADDITIONS TO THE LIBRARY AND MUSEUM.

THE SIXTY-THIRD ANNIVERSARY MEETING of the Members was held in the Theatre of the Institution, on Saturday, March 3rd, 1894, General GEORGE ERSKINE, Chairman of the Council, in the Chair.

The CHAIRMAN: Gentlemen,—I am sure you will all regret with me that we have not, to-day, the honour and pleasure of the presence of the President of the Institution. He is abroad, at the present time, and therefore could not take his place at this Meeting. He is a most excellent Chairman, and, I am sure, we shall feel his loss to-day. (Cheers.)

I. The Secretary read the notice convening the Meeting.

II. The Sixty-Third Annual Report was read as follows:—

1. The Council have much pleasure in submitting their Report for the year 1893.

MEMBERS.

2. The following is a statement of the changes which have taken place amongst the Members during the past year:—One hundred and Nine Life Members and Three hundred and Fifty-nine Annual Subscribers, making a total of Four hundred and Sixty-eight Members, joined the Institution during the past year. The loss by death amounted to Eighty-three, and Sixty-three Members withdrew their names.

The names of Eighteen Annual Subscribers, whose subscriptions were in arrear for two years, have, in accordance with Section V, par. 6, of the Bye-laws, been struck off the list of Members.

STATEMENT OF CHANGES AMONG THE MEMBERS SINCE 1ST JAN., 1893

	Life.	Annual.	Total
Members on the 1st January, 1893	1,679	2,978	4,657
,, joined during ,, ...	109	359	468
	1,788	3,337	5,125
Changed from Annual to Life..	+ 14	− 14	
	1,802	3,323	5,125

	Life.	Annual.			
Deduct—Deaths during 1893 ..	32	51			
Withdrawals	1	62	33	131	164
Struck off		18			
	33	131			
Number on 1st January, 1894..			1,769	3,192	4,961

A tabular analysis of the present and past state of the Institution is given in Appendix A.

For detail of Annual Subscribers, see Appendix B.

FINANCE.

3. An abstract of the Accounts, duly audited, is given below:—

ABSTRACT OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDING 31ST DECEMBER, 1893.

RECEIPTS.

	£ s. d.	£ s. d.
Balance Cr. 1st Jan., 1893		1,411 16 4
2,780 Members at £1	2,780 – –	
152 „ 10s.	76 – –	
£6 Life Members, who pay 10s. to receive Journal	1 10 –	
Honorary Members, who pay to receive Journal	4 10 –	
Extra Subscriptions...	45 19 3	
Arrears	3 10 –	
Subscriptions for 1894	18 2 –	
„ received from Agents, &c., paid in error	16 – –	
Entrance Fees ...	468 – –	
Life Subscriptions ...	1,095 – –	
		4,508 11 3
Donations received from Agents, &c., paid in error		22 10 –
Dividends		685 13 –
Sale of Journals		329 6 2
Miscellaneous Receipts		5 11 4
Advertisements in Journal ...		45 – –
Government Grant		600 – –
Interest on Money on "Deposit"		11 1 2
Lending Library		40 – –
"Temporary" Member, U.S.I. India		10 –
Sale of Library Catalogue		8 2 –
Donations		1,440 16 6
From Col. Hale, Balance "Foreign Section" Account		69 10 –
By Sale of Consols		2,577 9 –
Repaid by Bazaar Committee ...		500 – –
Received from Bazaar Committee		604 7 5
		£12,860 4 2

PAYMENTS.

	£ s. d.	£ s. d.
Secretary's Salary		400 – –
Editor and Librarian's Salary ...		300 – –
Lieut.-Colonel Day's „ ...		250 – –
Pensions		225 – –
Clerk's Salary...		91 – –
Asst. Clerk's Salary		70 4 –
Servants' Wages		376 8 6
„ Clothing		67 18 –
Assistance in Office		23 11 3
Insurance		32 5 –
Guarantee		3 – –
Rent, Old Building		200 7 3
Ground Rent, New Building ...		345 12 6
Rates		148 8 8
Water Rates		19 18 –
Taxes		83 10 2
Fuel		59 17 6
Lighting		47 6 9
Repairs to Building, Furniture, &c.		45 19 8
Cleaning Windows		9 10 –
House Expenses and Sundries ...		68 3 2
Safe and Cabinet		35 9 6
Museum		2 10 3
Library		136 7 11
Lending Library		21 19 3
Printing Accessions to Library Catalogue for 1892...		12 9 0
Journal. Printing	1,064 16 2	
Journal. Shorthand Reports ...	92 11 –	
Journal. Literary Services	219 10 –	
Journal. Slips and Short Copies of Lectures	70 1 3	
Journal. Miscellaneous ...	4 16 11	
		1,451 15 4
Lecture Expenses		2 12 8
Advertisements		166 7 –
Appeals to the Services, &c. ...		32 16 11
Postage { Letters ...	59 5 –	
Postage { Journals ...	401 4 8	
		460 9 8
Stationery and Sundry Printing...		190 1 7
Gold Medal		11 10 6
Telegraphic Address		1 1 –
Legal Expenses		26 10 –
Banqueting House, Whitehall (maintenance)		27 2 2
New Building...		5,967 16 6
Cash repaid to Agents		38 10 –
Charges from Agents		– 17 –
Advanced to Bazaar Committee...		500 – –
Total Payments		11,954 6 8
Balance. Cash in Bank ...	401 – 10	
Balance. Deposit, Commissioner of Woods	500 – –	
Balance. Deposit, Army and Navy Stores ...	2 1 4	
Balance. Deposit, Booksellers	1 5 8	
Balance. Petty Cash ...	1 9 8	
		905 17 6
		£12,860 4 2

We have examined the above Account with the Books and Vouchers, and certify it to be correct.

WILDE & VENABLES, Chartered Accountants.
F. F. PARKINSON, Major and Staff Paymaster, A.P.D. } Auditors.

30th January, 1894.

Dr. REVENUE ACCOUNT FOR THE YEAR ENDING 31ST DECEMBER, 1893. Cr.

£ s. d. £ s. d.

REVENUE ACCOUNT FOR THE YEAR ENDING 31st DECEMBER, 1893.

Dr.

	£ s. d.	£ s. d.
To Members' Subscriptions for 1893	2,879 - -	
,, Extra Subscriptions	45 19 3	
		2,924 19 3
,, Entrance Fees		468 - -
,, Life Subscriptions		1,095 - -
,, Dividends	685 13 -	
,, Interest on Deposit	11 1 2	
		696 14 2
,, Sale of Journal	273 1 2	
,, Advertisements	45 - -	
,, Life Members who pay 10s.	1 10 -	
,, Honorary Members who pay for Journal	4 10 -	
		324 1 2
,, Government Grant		600 - -
,, Lending Library		40 - -
,, Sale of Library Catalogue		8 2 -
,, Miscellaneous Receipts		5 11 4
		£6,162 7 11

Cr.

	£ s. d.	£ s. d.
By Secretary's Salary	400 - -	
,, Editor and Librarian's Salary	300 - -	
,, Lt.-Col. Day's Salary...	250 - -	
,, Clerk's Salary	91 - -	
,, Assistant Clerk's Salary	70 4 -	
,, Assistance in Office	23 11 3	
		1,134 15 3
,, Pensions		225 - -
,, Servants' Wages		376 8 6
,, ,, and Clerks' Clothing		67 18 -
,, Rent, Old Premises	200 7 3	
,, Ground Rent, New Premises	345 12 6	
,, Water	19 18 -	
,, Rates	148 8 8	
,, Taxes	83 10 2	
,, Insurance, Banqueting Hall	15 - -	
,, ,, Old Premises	17 5 -	
		830 1 7
,, Guarantee Premiums		3 - -
,, Fuel	59 17 6	
,, Lighting...	44 1 4	
		103 18 10
,, Repairs to Building, Furniture, &c.		33 18 2
,, Cleaning Windows		9 10 -
,, House Expenses and Sundries		68 8 -
,, Safe, Cabinet, &c.		35 9 6
,, Museum Expenses		2 10 3
,, Library		124 6 6
,, Lending Library		21 19 3
,, Printing Accessions to Library Catalogue, 1892		12 9 -
,, Journal	1,207 5 8	
,, Shorthand Notes	92 11 -	
,, Literary Services	150 - -	
,, Slips and Short Copies of Lectures	87 1 6	
,, Miscellaneous	4 16 11	
,, Postages	390 1 2	
		1,931 16 2
Lecture Expenses		2 12 8
,, Advertisements		138 7 -
,, Postages of Letters, &c.		59 5 -
,, Printing and Stationery		240 3 -
,, Gold Medal		11 10 6
,, Telegraphic Address		1 1 -
,, Legal Expenses		6 6 -
,, Banqueting Hall Maintenance		31 2 2
,, Balance to Balance Sheet		690 11 6
		£6,162 7 11

We hereby Certify the above Account to be Correct, WILDE & VENABLES, Chartered Accountants, F. F. PARKINSON, Major and Staff Paymaster, A.P.D. } Auditors.

30th January, 1894.

NOTE.—These two forms of Accounts have been introduced on the recommendation of the Chartered Accountant.

BALANCE SHEET, 31st DECEMBER 1893.

Cr.

	£ s. d.	£ s. d.
To Balance, 31st December, 189		26,711 5 6
,, Donations received	1,440 16 6	
,, ,, promised but not paid	426 6 -	
	1,867 2 6	
Less promised and not paid, 1892	401 6 -	
	1,465 16 6	
,, Cost of Appeal to Services, 1893... ...	32 16 11	
	1,432 19 7	
Bazaar	604 7 5	
Balance from Revenue Account, 1893 ...	690 11 6	
		2,727 18 6
,, Balance, 31st December, 1893, in favour of the Institution		29,439 4 0
,, Creditors—		
Printing Journal	270 5 6	
,, Slips and Short Copies	17 - 3	
,, General	51 12 8	
Binding	11 - 10	
Postage, December Journal	22 16 -	
Gas, December Quarter	13 12 1	
Law Expenses	6 6 -	
Banqueting Hall Maintenance, as estimated	4 - -	
		396 13 4
,, Subscriptions paid for 1894		18 2 -
		£29,853 19 4

	£ s. d.	£ s. d.
By Subscriptions in Arrear		29 - -
,, Outlay on New Building		6,486 12 11
,, Investments—		
£14,022 7s. 10d. Consols 2¾ p.c.	13,744 10 11	
£2,028 17s. 8d. India 3½ p.c.	2,201 6 9	
£3,044 17s. 11d. India 3 p.c.	2,984 - -	
£3,076 5s. 4d. Nottingham Corporation 3 p.c.	3,076 5 3	
		22,006 2 11
,, Donations promised and not paid		426 6 -
,, Cash Balances—		
Cash in Bank	401 - 10	
Deposit, Commissioner of Woods	500 - -	
Army and Navy Stores	2 1 4	
Booksellers	1 5 8	
Petty Cash	1 9 8	
		905 17 6
		£29,853 19 4

We hereby certify that the above account is correct, we have verified the Cash Balances and Investments.

WILDE & VENABLES, Chartered Accountants.
F. F. PARKINSON, Major and Staff Paymaster, A.P.D. } Auditors,

30th January, 1894.

Estimate of Receipts and Expenditure for the Year 1894.

Receipts.	£	s.	d.
Cash Balances	905	–	–
Annual Subscriptions:			
£ s. d.			
At £1 .. 3,267 – –			
„ 10s. .. 70 – –			
	3,337	–	–
Extra Subscriptions ..	468	–	–
Entrance Fees	400	–	–
Life Subscriptions ..	900	–	–
Dividends	419	–	–
Sale of Journals	220	–	–
Government Grant ..	600	–	–
Lending Library	40	–	–
Advertisements in Journal	45	–	–
Sale of Library Catalogue	10	–	–
Total Estimated Receipts	£7,344	–	–

Expenditure.	£	s.	d.
Secretary's Salary ..	400	–	–
Editor and Librarian's Do.	300	–	–
„ „ for half January	13	–	–
Col. Day (3 months) ..	62	–	–
Pensions	260	–	–
Clerk's Salary	91	–	–
Assist. Clerk's Do. ..	71	–	–
Servants' Wages	380	–	–
„ Clothing ..	50	–	–
Insurance	45	–	–
Rent, Present Building ..	133	–	–
Ground Rent, New Building	580	–	–
Rates	170	–	–
Taxes	106	–	–
Fuel	73	–	–
Lighting	50	–	–
Repairs to Buildings ..	30	–	–
House Expenses	60	–	–
Library	130	–	–
Lending Library	30	–	–
Accessions, Lib. Catalogue	12	–	–
Journal	1,500	–	–
Advertisements	170	–	–
Postage { Journal .. £320 / Letters .. 50 }	370	–	–
Stationery, &c.	170	–	–
Gold Medal	12	–	–
Banqueting House ..	20	–	–
Gratuity, Col. Day ..	300	–	–
Total Estimated Expenditure	5,588	–	–
Balance Cr.	1,756	–	–
	£7,344	–	–

	£	s.	d.
Balance Cr., as above ..	1,756	–	–
Value of Securities, 31st Dec., 1893	22,079	–	–
	£23,835	–	–

	£	s.	d.
New Building, due on contract	15,325	–	–
Balance in favour of the Institution	8,510	–	–
	£23,835	–	–

Life Subscriptions and Capital Account.

4. The Council having, in July last, deemed it necessary to bring to the notice of members the expediency of providing for an increase of the future revenue of the Institution, the appeal which was then

made to them to increase their subscriptions, met with a favourable response from 861 out of 4,961 Members, and to them the Council now tender their thanks for the contributions which have thus been made to the funds. But the amount of these contributions is not sufficient to place the income of the Institution on such a footing as to supply the means of carrying on its administration with the degree of efficiency desired by those who are interested in its welfare.

The Council, however, hope that many of those members (Life and Annual) who have not yet responded to the appeal already made, will, upon a reconsideration of the subject, be disposed to follow the example of those who have already come forward to help the Institution by giving small extra subscriptions of from 5*s.* to 20*s.* annually. If these subscriptions became general, they would not only produce a substantial addition to the revenue, but would also afford an unmistakable proof that members are resolved that the work of the Institution shall be prosecuted in a way commensurate with the high position which it now holds in the country.

The New Premises of the Institution.

5. During the past year the building operations on the new premises, although subjected at one time to some unavoidable delay, have progressed satisfactorily, and will, it is hoped, be completed in the course of the summer of the current year.

The contracts entered into for the execution of the various portions of the work are well within the original estimates framed by the architects, Messrs. Aston Webb and Ingress Bell, a fact which reflects great credit on these gentlemen.

On June 6th, H.R.H. the Prince of Wales graciously laid the Memorial Stone of the new building, and afterwards opened a Bazaar, held in the Banqueting House, in aid of the Building Fund. The amount realised was £604 7*s.* 5*d.*

Changes in the Staff of the Institution.

6. Colonel Bowdler has resigned the office of Editor and Librarian. The Council regret the loss of his services, and have taken steps to fill the vacancy.

Collection of Coins.

7. In 1862, Mr. Walter Hawkins bequeathed to this Institution a valuable collection of coins and medals. At the Annual General Meeting, held in March, 1863, the Council of that day asked the sanction of the General Meeting to sell a portion of the Collection, consisting of electrotype copies of certain gems and coins, to Queen's College, Cork, as they thought that the Institution could very well spare that part of the Collection, which was more fitted for a college than the Royal United Service Institution.

A resolution embodying the above was put to the Meeting and carried.

The Council, after having very carefully considered the matter, think that the time has arrived for selling a further portion, retaining, however, all such as have any Naval or Military interest attached to them.

A resolution on this subject will be submitted to the General Meeting.

Papers.

8. Papers on the following subjects were read and discussed during the year, and have appeared in the Journal, viz.:—

H. O. Arnold-Forster, Esq., M.P., on "The System of Mounting and Placing Guns on board ships of the Royal Navy."

Eric Stuart Bruce, Esq., M.A., Oxon, on "Electric Balloon-Signalling."

Captain G. K. Scott-Moncrieff, R.E., on "The Tactical Employment of Field Companies of Engineers in Combination with the other Arms."

Colonel F. C. Keyser, C.B. (Inspector of Signalling), on "The Different Systems of Signalling in the Field."

Captain W. C. Crutchley, R.N.R., on "The probable Effect of the Changes in Modern Warfare on the Mercantile Marine."

Captain Alfred Hutton, late King's Dragoon Guards, on "Our Swordsmanship."

Commander Wallace B. McHardy, R.N., on "A Scheme for Establishing a Royal Army Society in each County and City in order to Improve the Status of the British Soldier on his return to civil life."

Colonel E. T. H. Hutton, p.s.c., A.D.C., on "Marching (Mounted or on Foot) as a Science."

Colonel T. S. Cave, Commanding 1st Vol. Batt. Hampshire Regiment, on "Volunteer Transport."

Captain J. E. W. Headlam, R.A., on "The best type of Field Gun for the British Land Service, including the question of Q.F. Guns."

Captain H. D. Sichel, 3rd Voll. Batt. West Riding Regiment; Supply and Transport Officer, West Yorkshire Brigade, on "Mobilization of the Volunteers."

Major-Gen. F. H. Tyrrell, Madras Army, on "Universal Compulsory Service for the United Kingdom."

C. V. Boys, Esq., F.R.S., Assistant Professor of Physics, Royal College of Science, London, on "Photography of Flying Bullets by the Light of the Electric Spark."

Harry Williams, Esq., R.N., Chief Inspector of Machinery, on "How best to secure Continuity in the Effective Service of Modern Ships of War for Successive Commissions."

Major E. S. May, R.A., Professor of Military Topography, Royal Military Academy, on "Manœuvres of Masses of Artillery."

C. A. Hereshoff Bartlett, Esq., on "The Banqueting House (Whitehall)."

Lieut.-Colonel G. V. Fosberry, V.C., on "The Phonograph, and its Application to Military Purposes."

Colonel H. Bengough, C.B., on "Dress and Equipment."

Major F. G. Stone, Brigade Major, R.A., S.E. District, on "Mobilization for Home Defence."

J. K. Laughton, M.A., Professor of Modern History at King's College, London, and Lecturer in Naval History at the Royal Naval College, Greenwich, on "Recent Naval Literature."

Colonel J. B. Richardson, R.A., Commandant, School of Gunnery, on "Coast Artillery Practice."

Colonel C. H. Coles, 1st London Vol. Art.; Major E. Satterthwaite, 2nd Vol. Batt. R. W. Kent Regt.; and Lieut-Colonel W. W. M. Smith, h.p., R.A., on "Tactical Deductions from the Recent Skeleton Winter Exercises near Reading."

LIEUTENANT J. F. STUART, R.N., on "The Advisability of Adopting a Mariner's Compass Card marked in Degrees only, in place of the one now in use."

COLONEL G. E. GOURAUD, United States Army, on "The Telephotos: a new means of Electrical Signalling, by night and by day, for the Naval, Military, Merchant Marine, Lighthouse, and Life-saving Services; with practical demonstrations of its application."

The theatre has been lent to the Home District Tactical and War Game Society, and to the Metropolitan Volunteer Serjeants' Tactical Society for their lectures, to the National Rifle Association, and to several other Societies connected with the Services for their meetings.

LIBRARY.

9. The Library now contains 24,471 volumes, of which three hundred and seventy-two have been added since the last Report; of these, one hundred and eighty-one have been purchased, one hundred and thirty-five presented, and the remainder are bound periodicals, &c.

Donations of books and maps have been received from the Governments of Austria, Denmark, France, Germany, Italy, the Netherlands, Russia, Spain, Sweden, Switzerland, and the United States.

The thanks of the Council have been conveyed to the several Governments for these donations.

The Institution is indebted to the Lords Commissioners of the Admiralty, to the Secretaries of State for War, and for India, for copies of various works issued by their Departments, and to the Speaker of the House of Commons for Parliamentary Papers.

The exchange of Journals with Foreign Governments, and with many Scientific Societies in this and other countries, has been continued.

The accessions to the Library to the 31st December, 1893, will be shortly published in the same form as the new Catalogue, and, in future, these accessions will be issued yearly.

The new Catalogue is found to be of great utility; it is on sale to members, price 10*s.*; postage, 9*d.*; Accession Catalogues, 1*s.* each.

The Lending Library still continues a success. The numbers who have subscribed since its formation are as follows:—1887, 19; 1888, 58; 1889, 60; 1890, 79; 1891, 71; 1892, 93; and 1893, 70. The fund, after paying all charges against it, shows a balance Cr. of £107 17*s.* 6*d.* Through its medium Members have the advantage of obtaining, by the payment of a subscription of 10*s.* for 12 months, the loan of books, with the exception of works of reference, &c.

GOLD MEDAL.

10. Eleven Essays were submitted for competition, the subject being:—

"The Tactics best adapted for developing the power of existing Ships and Weapons (Gun, Ram, and Torpedo) which should regulate Fleets, Groups and Single Vessels in Action."

Admiral Sir William Dowell, K.C.B., Rear-Admiral Rawson, C.B., and Captain Pearson, R.N., A.D.C., kindly undertook the duties of Referees, and their decision will be made known to the Meeting.

11. SUBJECT FOR THE MILITARY PRIZE ESSAY, 1894.

"Lessons to be derived from the operations of landing an Expeditionary Force on an enemy's coast in past wars, with special references to similar operations on the part of our Army in the future."

The competition is open to all Members, and to all who are eligible to become Members.

MEMBERS OF COUNCIL.

12. The following Members retire, having served three years on the Council:—

NAVAL.	MILITARY.
Captain EARDLEY-WILMOT, R.N.	General Sir REDVERS BULLER, V.C., &c. Viscount DILLON, F.S.A. Lieutenant-General W. H. GOODENOUGH, C.B. Colonel MALCOLM GREEN, C.B. Colonel LONSDALE HALE. Colonel C. G. SLADE. Colonel J. B. STERLING. General J. F. WALKER, C.B., F.R.S.

CONCLUSION.

In conclusion, the Council, although unable to fix the exact date on which the new premises will be opened for occupation, yet feel justified in anticipating that this event will not be delayed beyond the autumn of the present year, and they trust that as soon as the Institution is installed in a handsome and commodious building, in the finest thoroughfare of the Metropolis, it will present so many attractions to the Naval and Military Services that they will not fail to accord to it a still further degree of support than that which it has hitherto received at their hands.

WHITEHALL YARD,
16*th February*, 1894.

By Order,
GERALD R. MALTBY, LIEUT. R.N.,
Secretary.

Appendix A.

Tabular Analysis of the State of the Institution.

Year. 1st Jan. to 31st Dec.	Annual Subs. received.	Entrance Fees.	Receipts (from all sources).	Life Subs. received.	Amount of Stock.	Invested in the purchase of Books, &c.	No. of Vols. in Library.	No. of Members on the 31st Dec.	Number of Visitors
	£	£	£	£	£	£			
1831	654	..	654	1,194	..	..	..	1,437	..
1832	1,146	..	1,146	973	..	..	..	2,699	..
1833	1,405	..	1,450	692	..	..	..	3,341	..
1834	1,500	..	1,549	583	1,100	..	..	3,748	13,376
1835	1,480	..	1,574	366	2,430	40	..	4,155	8,537
1836	1,570	..	1,682	330	3,747	45	..	4,069	8,521
1837	1,549	..	1,747	222	4,747	180	..	4,164	10,907
1838	1,462	..	1,634	230	5,500	246	..	4,175	15,788
1839	1,399	..	1,565	168	5,500	292	..	4,186	16,248
1840	1,363	..	1,525	198	5,500	446	5,500	4,257	17,120
1841	1,450	..	1,643	186	6,000	243	5,850	4,243	19,421
1842	1,373	..	1,565	144	6,400	373	6,450	4,127	21,552
1843	1,299	..	1,494	140	6,700	237	7,000	4,078	27,056
1844	1,274	..	1,408	112	3,000	298	7,850	3,968	22,767
1845	1,313	..	1,466	228	1,500	127	8,100	3,988	21,627
1846	1,298	..	1,456	138	1,500	74	8,410	4,031	32,885
1847	1,314	74	1,502	132	1,700	37	..	4,017	38,699
1848	1,175	57	1,375	48	1,700	85	9,641	3,947	37,140
1849	1,176	72	1,375	84	1,150	58	..	3,970	33,333
1850	1,141	106	1,294	198	600	36	..	3,998	33,773
1851	1,136	131	1,292	66	666	34	10,150	3,188	52,173
1852	1,134	133	1,281	114	200	43	10,300	3,078	20,609
1853	1,243	319	1,684	264	528	41	10,420	3,251	25,952
1854	1,200	138	1,368	126	612	95	10,587	3,171	22,661
1855	1,159	107	1,289	120	653	55	10,780	3,131	14,778
1856	1,216	197	1,519	156	761	47	10,832	3,204	16,184
1857	1,258	176	1,937	78	1,038	40	10,960	3,168	12,755
1858	1,318	221	2,102	105	438	31	11,062	3,246	25,747
1859	1,526	195	2,277	512	946	70	11,320	3,344	28,739
1860	1,961	298	3,577	397	2,178	114	11,517	3,518	28,011
1861	2,122	305	2,899	266	2,846	99	11,812	3,689	23,296
1862	2,296	242	3,127	239	3,178	109	12,026	3,797	27,215

Appendix A—(*continued*).

Tabular Analysis, &c.

Year. 1st Jan. to 31st Dec.	Annual Subs. received.	Entrance Fees.	Receipts (from all sources).	Life Subs. received.	Amount of Stock.	Invested in the purchase of Books, &c.	No. of Vols. in Library.	No. of Members on the 31stDec.	Number of Visitors.
	£	£	£	£	£	£			
1863	2,379	218	3,100	405	3,583	143	12,296	3,847	18,150
1864	2,425	215	3,253	222	4,516	116	12,700	3,902	17,276
1865	2,435	154	3,467	235	4,804	137	13,000	3,895	18,253
1866	2,435	157	3,488	299	5,486	150	13,337	3,891	17,067
1867	2,431	141	3,467	208	5,732	140	13,800	3,823	17,211
1868	2,446	184	3,534	297	6,396	119	14,100	3,812	16,417
1869	2,368	165	3,485	238	6,653	232	14,660	3,792	15,947
1870	2,376	178	3,493	333	7,313	140	15,055	3,831	18,654
1871	2,455	237	3,677	538	7,748	202	15,501	3,922	19,420
1872	2,620	336	4,111	713	8,927	192	15,761	4,116	19,773
1873	2,776	295	4,316	535	9,465	222	16,227	4,276	18,183
1874	2,819	216	4,491	409	10,189	218	16,624	4,330	16,771
1875	2,801	154	4,595*	469	10,721	228	17,000	4,308	15,960
1876	2,794	162	4,500	437	11,305	171	17,700	4,320	15,543
1877	2,840	218	4,750	526	11,725	217	18,300	4,405	15,682
1878	2,881	231	4,700	459	12,091	231	18,750	4,485	17,881
1879	2,904	180	4,490	407	12,505	254	19,170	4,473	15,529
1880	2,962	255	5,115*	577	12,965	240	19,565	4,531	13,041
1881	2,893	238	4,967	645	13,670	240	19,920	4,577	12,507
1882	2,829	181	4,739	491	14,069	174	20,352	4,591	12,546
1883	2,892	205	5,023	692	15,251	157	20,658	4,627	11,482
1884	2,851	172	4,950	491	16,000	207	20,943	4,613	12,388
1885	2,857	181	5,121	545	16,902	169	21,370	4,377	12,220
1886	2,757	141	4,842	358	17,492	192	21,778	4,368	12,358
1887	2,728	141	4,898	401	18,372	160	22,087	4,280	10,974
1888	2,716	216	5,238*	512	19,705	195	22,565	4,257	14,848
1889	2,663	148	4,874	357	20,498	140	23,046	4,226	13,333
1890	2,661	154	4,875	371	21,217	163	23,513	4,200	15,019
1891	2,640	189	5,004	454	21,942	153	23,845	4,204	13,892
1892	2,930	605	9,429	1,572	24,805	142	24,099	4,657	14,875
1893	2,929†	468	8,334	1,095	22,172	157	24,471	4,961	15,300

* A legacy of £100 was received this year.

† 319 Members joined between October and December, 1892, who were exempt from paying subscription for 1893.

Appendix B.

Detail of Annual Subscribers.

1893.

Paid for 1893 @ £1		2,780
„ „ „ „ 10s.		152
„ in 1892 for 1893		10
New Members who joined between October and December, 1892		319
Commuted to "Life," who did not pay subscription for 1893		2
Deaths and withdrawals, subscriptions unpaid for 1893		27
Members two years in arrears		18
Do. in arrears for 1893		29
		3,337
Deduct, Annual to Life		14
		3,323
„ { Deaths 51 / Withdrawals 62 }		113
		3,210
„ Struck off for non-payment		18
		3,192

The Chairman:—

My Lords and Gentlemen,—It is now my duty to propose a Resolution to the following effect: "That the Report now read be adopted and printed for circulation among the Members." I think that I cannot do better, in moving this Resolution, than say a few words in explanation of the present position of the Institution. Of course, the first thing which attracts our attention is the progress of the new building, which is now making its appearance at the south end of the Banqueting House. I dare say some of you have taken the trouble to look into the reports, which have been made from time to time, of the accommodation which will be furnished by the new buildings; but as, perhaps, others have not done so, it may be well that I should describe to you what the accommodation will be. In the first place, we have the old Banqueting House, which now is waiting for the contents of our museum to be transferred to it. It comprises two very handsome halls, one of which, I may say, has been created out of the old cellars of the original house; and I think that the accommodation in these halls for the museum will be quite sufficient for our purposes. The entrance to the new building will be from Whitehall. On entering the building you will have the hall, and then, a little beyond that, the main staircase. This main staircase will divide the building into two parts, which may be called the east and west portions. The east portion will face Whitehall Gardens, and the west portion Whitehall thoroughfare. Above the entrance hall, on the Whitehall side, will be three floors, and those floors will contain large and commodious rooms for the accommodation of members, and for the different purposes of the Institution. Then, on the other side, or what I call the east side of the new building, there will be, on the ground floor, the lecture theatre, which will contain about five hundred people, and contain them without inconvenience—I hope that it will be a very different place from this. (Cheers and laughter.) And then, above the theatre, will be a reference library, which will be a very handsome room, and contain all the books that we have at the present time. Then, on the top of the building, there will be further accommodation. Above the reference library there will be a very good room, about forty feet long, which will

be available for any purpose to which it may be assigned hereafter. Then, on the same floor, on the opposite side, that is, facing Whitehall, will be the accommodation given to the caretaker and the housekeeper of the Institution. If you will put all those things together, I think you will come to the conclusion that the accommodation will be ample. Now we come to the financial aspect of the matter; and the first thing I have to say in regard to that is that when we take possession of our new premises we shall have the satisfaction of knowing that we do so without any debt. (Cheers.) But then arises the question—Shall we be able to pay our way? Now the present accounts, which are published with the Report, do not give a clue to how matters will stand when we come to what I may call the normal financial position of the Institution. At present, we are in a transition state, as you all know. We are paying for the erection of the new buildings, and we have not yet taken into account some of the expenses which we shall have to provide for when we are in our new premises. In order to get an idea of what the state of our revenue will be when we are in possession of our new building, I must ask you to go back for a couple of years. At that time you may recollect that when we were debating in this theatre whether we should adopt what was called then the Whitehall Scheme, the Council placed before the General Meeting a statement of accounts, and an estimate of how matters would stand when our new building had been paid for; and it was made out, at that time, that there would be a deficit in the revenue of some £790 a year. That deficit was caused chiefly by the abstraction from the credit side of our account of the interest of the money which we should have to pay for the erection of our new premises. Then, unfortunately, not very long after that period, we had other expenditure to put down, which made the deficit still larger than it was when we decided upon adopting the Whitehall Scheme. We had to provide for the pension of Captain Burgess; and also, about that time, the Admiralty (I believe, at the instigation of the Treasury) decided upon withdrawing from us the annual payment in consideration of the copies of the Journal which were supplied to the ships' libraries. Altogether, that made up a deficit of about £1,250. We all know that in every house there is a skeleton, and many people would describe that deficit as our skeleton; but I am happy to say that the skeleton in our cupboard has gone, and I do not think that you will find a bone of him left. (Cheers.) That has been produced somewhat in this way. In the first place, up to the present time, and looking forward a few months, which we are entitled to do, we shall have a net increase from annual subscribers of 600. (Cheers.) That is, of course, an increase of income of £600 a year. Next we have extra subscriptions to the amount of £500 a year; and then we have £150 a year as the interest on the donations which we have received for what we have hitherto called our building fund. Putting all those sums together, I make up £1,250, which is the amount of our deficit, increased in the way which I have just described; so that we are now in the position of having our revenue *in equilibrio*. I recollect that when I was at school, and studying arithmetic, whenever I did a sum I was told that I must prove it; and, acting upon that principle, I have taken a good deal of trouble in making an estimate for the next year—not for this current year, but for the year 1895, when all our accounts will be in a normal state; and I found that the equilibrium of revenue and expenditure comes up again, so that I think that we are entitled to consider that we shall be able, next year, when we take possession of our new premises, to pay our way. (Cheers.) That is certainly a satisfactory statement; but I do not think that we should be justified in going to the extent of saying that we can now "rest and be thankful." I must remind you that that calculation of revenue is made upon the understanding that we are using our life subscriptions as current revenue. We are quite entitled to do that by all the rules of finance. It is justifiable finance, and at present it is necessary finance; but I do not think that it is what I should call satisfactory finance. We shall be able to pay our way in the manner that I have described, but we shall have nothing left for any contingency which may arise; and I think that we should aim at keeping our life subscriptions, as we did previously to all this turmoil in our finances, as a separate fund. (Hear, hear.) Well, if we do that, of course we must continue our endeavours to increase the income of the Institution, and there are three ways of doing that. First of all, there is the formation of what we have hitherto called our building

fund; that is of a capital account. Hitherto, that has not been a very successful business. During the two years of which I have been speaking, we have only raised from £4,500 to £5,000, which is not a very great deal out of £25,000, which we aimed at getting when we started the fund. However, things may improve. I may mention, while on this subject, that the bulk of the contributions to that fund have come out of the pockets of the Members of the two Services. We have received very little assistance indeed from the general public; but, as I say, there may be better things in store for us in that respect. Then another way of raising our income would be by means of extra subscriptions of Members. The idea of that was started, last July, by the Council, and since then we have, as I mentioned before, received an addition to our revenue of £500 a year. That addition has been contributed by about one-fifth of the total number of Members of the Institution. There are four-fifths who have not responded favourably to the appeal which was made to them when the circular was sent out. Perhaps, hereafter, when they see what their fellow Members have done, they may take a different view of matters. Certainly, the demand that is made upon them is not very great. It is an extra subscription of 5*s.* a year, that is 5*d.* a month, not quite 1½*d.* a week. (Laughter.) Then we come to the third way of raising money, and that is by getting new Members. That is the most satisfactory way of all, because not only does it bring money into our coffers, but it extends the influence of the Institution, and shows that it is appreciated by the Members of the two Services. (Hear, hear.) But however the money is to be raised, I think that, on consideration, you will agree with me that our efforts should be continued to raise an additional revenue for the Institution, otherwise the Council will not be placed in the position in which it should be to carry out the extension of the work of the Institution, to which all its best friends have been looking forward during many years. I do not think that I have anything further to add to what I have said, and therefore I will move the Resolution which I have read to you.

Admiral BOYS:—

My Lords, Mr. Chairman, and Gentlemen,—It becomes my duty to second this Resolution, and I am very happy to do so. After the clear and able statement of our Chairman as to the position in which we stand, I intend to detain you but a very short time. There is only one remark which I should like to make, and that is, to appeal to Naval Officers who are not Members and who have not responded as liberally as was expected to the circular mentioned, and especially to the juniors in the Naval Service, that they should take advantage of our Institution, which is now undergoing such great changes and improvements, and at once become Members. And, also, I should like to make an appeal to the Officers of the Royal Naval Reserve, who are always well received, and, I think, always will be. I would add that I think that this Institution may be called the *cheapest* Institution in London. I think the subscription to it is less than to any institution that I know of, and I think that the advantages are quite equal to, or greater than, those of any other. I have much pleasure in seconding the proposition for the adoption of the Report.

Lieut. Sir CHARLES CRAUFURD, Bart., R.N.:—

I think it would be a convenience to Members studying in the Institution, if light luncheons could be procurable in the new building.

The CHAIRMAN:—

With regard to the remark which has just been made, I will undertake, on the part of the Council, to say that the subject shall be considered; but I may say at once that I do not think that we can go into the question of luncheons in the new building. As to a luncheon it is a very difficult matter to decide what it is. People have very different ideas about luncheon. I think mention was made of a light luncheon. Well, if a light luncheon consists of a cup of coffee and bread-and-butter, or something of that sort, that will be obtainable. You can get at present, in this building, a cup of tea or coffee at any time; but beyond that there is no prospect of our being able to go.

A MEMBER:—

May I make a suggestion with reference to the statement of accounts? I see here put down, that the postage of the Journal is £320 a year. Might it not be advisable to ask the Members whether they would not pay 5*s.* a year for the expense of the postage of the Journal? £320 seems to be a very large sum under the head of postage of the Journal. Of course I merely mention it. The Council might take it into consideration.

The CHAIRMAN:—

Of course it would be a very great assistance to the funds of the Institution if Members would pay for the postage of their Journals, but we could not introduce that system without altering our Bye-Laws, because the Journal, according to our Bye-Laws, is supplied to the Members of the Institution free of cost. But the matter could be arranged very easily by the Members who have not already given extra subscriptions doing so to the extent of 5*s.* a year. (Laughter and cheers.) That would settle the question.

Sir GEORGE CHUBB:—

May I ask, with reference to the statement of the investments, on page 4 of the Report, whether those investments are reckoned at their original purchase price or at their present value?

The CHAIRMAN:—

At the original purchase price. It was considered not advisable to alter the amount from year to year. Of course we all know that the value of investments varies from day to day, but we thought it not expedient to make alterations from year to year in the accounts.

The Motion having been put from the Chair, was declared by the Chairman to be carried unanimously.

Admiral Sir EDWARD FANSHAWE, G.C.B.:—

The Resolution which I have to propose is: "That the thanks of this Meeting be given to the Auditors, A. H. Drummond, Esq., Major Parkinson, A.P.D., and the firm of Messrs. Wilde and Venables, Chartered Accountants, for their valuable services, and that the following gentlemen be elected for the ensuing year, viz.: Allan H. Drummond, Esq., Follett Pennell, Esq., Deputy Accountant General, Admiralty, and Messrs. Wilde and Venables." It will not be necessary for me to occupy your time by making any observations, because I am quite sure that every person here will be willing to give his cordial thanks to the Auditors for their services to the Institution. I may mention that, as many of you will recollect, at the last Annual Meeting it was decided that a Chartered Accountant should be appointed to audit the accounts of the Institution, and, therefore, in accordance with that decision, Messrs. Wilde and Venables have been appointed. But, by our Charter, we are bound to have three auditors, and, therefore, two gentlemen, Major Parkinson and Mr. Drummond, have given their assistance, as Mr. Drummond has done for a good many years. That is the reason why there are three. Mr. Drummond's name does not appear as a signatory to the audit, because he happened to be accidentally unable to be present at the time, but, as everyone knows, he has given for many years his valuable assistance to the Institution, and I hope that he will long continue to do so. (Cheers.) Both he and Major Parkinson, and Colonel Wilde (as representing the firm of Wilde and Venables), have given valuable assistance in preparing the accounts of the Institution for the last year, and I beg leave to propose the Resolution which has been put into my hands. (Cheers).

Colonel STANLEY BIRD, 1st Middlesex Rifle Volunteers:—

I shall have much pleasure in seconding the Resolution. At the same time, I would just call the attention of the Meeting to the fact that the accounts now are presented in a totally different form from that in which they were before and

I think that you will admit that they are in a much more intelligible form. Messrs. Wilde have devoted a great deal of time to the interpretation of these accounts, and I think that very great credit is due to them for having put them in the way they have. I have very much pleasure in seconding the Motion.

The Motion having been put from the Chair, was declared by the Chairman to be carried unanimously.

The CHAIRMAN:—

The next business is the Report of the Referees.

The Secretary then read the report of the Referees (Naval Prize Essay), which stated that the Gold Medal was awarded to Commander F. C. D. Sturdee, R.N., while the Essay by Lieutenant Somerset A. G. Calthorpe, R.N., was honourably mentioned.

The CHAIRMAN:—

Is Captain Sturdee in the room?

No response being given, the Chairman said:—

Of course this Gold Medal must be retained till I have the opportunity of presenting it to Captain Sturdee.

Admiral Sir HOUSTON STEWART, G.C.B.:—

Sir, I am confident that it is the wish of this Meeting that the thanks of the Institution should be given to those distinguished officers who, having devoted their time and attention to the examination of these essays, have rendered such valuable service to the Institution. It is not for me to dilate upon the difficulties of the work they have accomplished. That will readily suggest itself to the minds of all of us when we consider that there are eleven essays, some in handwriting, treating of a most important question of Naval Warfare. I know that there are Members of the Institution here, who, from their own practical experience in having acted as Referees, are much better able to speak on such a subject than I am. I will not say that there are no other officers who would have been as good Referees, because I know that I could not say anything which would be more offensive to my friend, Sir William Dowell, and his colleagues; but this I do say, that the Institute is very fortunate in having obtained their services. (Cheers.) Their brother officers in the Navy know—and I dare say many officers of the sister Service concur with us—that they have brought large and ripe experience, sound judgment, and impartial minds to bear on this important subject. (Cheers.) I therefore propose, Sir, that the Referees shall receive what I always hope will be considered an acceptable distinction, and that is, the thanks of the United Service Institution for the valuable services rendered to it. (Cheers.)

Colonel STERLING, Coldstream Guards:—

Mr. Chairman, my Lords, and Gentlemen,—I have much pleasure in seconding the Proposition which Sir Houston Stewart has so eloquently proposed. I am sure that while we get the stamp of men that we have here mentioned as taking an interest in the essays in this Institution, it will not only further the interests of the Institution, but it will further the interests of the country. I have great pleasure in seconding that Proposition.

The CHAIRMAN:—

Before I put the Resolution, Gentlemen, I may mention that this is the second time that Captain Sturdee has obtained the Gold Medal. (Cheers.)

The Resolution having been put from the Chair, was declared by the Chairman to be carried unanimously.

Admiral Sir Wm. Dowell, K.C.B.:—

I think, in expressing my thanks for the complimentary vote which has just been passed for the services rendered by myself and my colleagues—Admiral Pearson and Captain Rawson—I should state that we had great difficulty in coming to a decision on the matter. Nearly all the essays were very good: I should think above the average. The subject was a very large one; but most of the essays wandered into many subjects beyond the text, they were interesting and instructive, and showed that great pains and thought had been bestowed upon them, but they were not all relevant.

Colonel Walford, R.A.:—

Gentlemen, I have to bring before you a Motion connected with a portion of the Report, on page 6, which refers to the collection of coins which is the property of the Institution. I think I, perhaps, had better begin by reading the words of the Resolution:—"That the proposal contained in the Annual Report to effect a further sale of the coins belonging to the Institution be approved, and that the Council be requested to proceed with the sale accordingly, and to apply the proceeds for the use and benefit of the Institution." Perhaps a few words of explanation will be desirable with regard to these coins, because probably a large proportion of you are, as myself was a few days ago, totally unaware of their existence. They are to be found in the majority of cases in the long library, where you will see, if you seek for them, a large number of cabinets, and I have the best authority, that of the Secretary, and also of Colonel Day, who has been here for many years, in saying that hardly anyone ever looks at them. They are very many in number, and are of various kinds. There are Greek and Roman coins, English coins, and coins of all nations, both European and Asiatic. Together with these there is a considerable collection of commemorative medals, and some few actual war medals, but not very many. It is proposed that this collection shall be carefully revised, both before it is brought forward for sale and also when the catalogue is printed, so that every medal and, I presume, every coin which can have either a Military or a Naval interest shall be kept for the Institution. (Cheers.) I may say that this collection has already been partially looked through by Prince Louis of Battenburg, who was to have moved the motion to-day, but who is unfortunately unable to be present. Lord Chelmsford and myself went through the collection roughly the other day, and took out several medals of considerable interest. I may mention that among others we have found a medal that was given to Indian chiefs by George the Third after the war against America; also a specimen of the earliest medal given by the East India Company after the campaign in the Deccan; and, further, an exceedingly handsome medal in commemoration of Culloden, together with a series of decorations that were worn both by the Cavaliers and by the Roundheads in the Civil War. With regard to the majority of the collection, I hope I shall carry you with me in saying that, interesting though they may be to numismatists as the actual coins of foreign nations, and even of our own, of early date, they have no special value to us. That, I think, is sufficiently proved by the fact that no Member of the Institution appears ever to look at them. Apart from the money point of view and the fact that we have a certain sum of money there locked up, and producing no benefit whatever to the Institution, I cannot help thinking that, in the interest even of the general public and especially of gentlemen who have knowledge of such matters, it would be a considerable advantage that these coins should be removed from the Institution, where, as far as I can make out, they appear to be wasted. I do not know very much about coins, but I saw one coin there of exceeding interest. It was one of the gold coins that were struck in order to pay the ransom of King John of France when he was captured by the Black Prince. I do not know how this motion is likely to be received by the Meeting, but, anticipating that there will be no considerable opposition, I venture to think that it is not necessary for me to waste your time in further urging the necessity of selling the coins. As you are all aware, we are passing through a temporary crisis, and I think that we ought to reserve to ourselves simply such things as are strictly necessary and are likely to further the

interests of the Institution and the interests of the Services. There is one other point I should notice, and that is that in the Report it is said that this collection was given by Mr. Walter Hawkins. The coins given by him form by far the larger portion of the collection, but there are several other cabinets which were given by gentlemen whose names, so far as I can gather, are lost. The reason that I mention this fact is that the Council propose to sell all the coins and medals except those which have a Naval or Military interest, and not those alone which were bequeathed by Mr. Hawkins. I therefore beg to move: "That the proposal contained in the Annual Report, to effect a further sale of the coins belonging to the Institution, be approved, and that the Council be requested to proceed with the sale accordingly, and to apply the proceeds for the use and benefit of the Institution."

General Lord CHELMSFORD, G.C.B.:—

In rising to second this Resolution, I am anxious to express my individual hope that it may be acceded to. I went over, very carefully, with Colonel Walford, the collection, and I was surprised to see such a large number of coins which may have value in themselves, but certainly have no Military or Naval interest whatever. But at the same time we were delighted to find that there were amongst them several that we should wish to retain and see set out in a proper manner when we move into our new quarters. Of course if all the present collection of coins were to be retained and set out in a manner which would enable them to be seen, they would require such a space as it would be perfectly impossible to spare, without crowding out other more interesting exhibits. But what we hope is that those medals which we retain, which, as you have already heard from Colonel Walford, are of considerable interest, will all be able to be placed in glass cases, with a short description over each of them, so that they can be intelligently studied. I therefore have great pleasure in seconding the Resolution which Colonel Walford has moved.

Commander SULLIVAN, R.N.:—

May I say, as it has not been said by anybody else, that one coin which was mentioned, the ransom one, is surely one of very strong Naval interest.

Lord CHELMSFORD:—

That would be retained.

Commander SULLIVAN, R.N.:—

I thought that it was said that it had no Naval interest.

Lord CHELMSFORD:—

Oh, no; any of those which have interest in either of the Services will be retained.

The Motion having been put from the Chair, was declared by the Chairman to be carried.

The CHAIRMAN:—

Before I put the next Resolution, Gentlemen, I must apologize to the Meeting for a slight error in the wording of the Resolution. In the last line but one it appears that the candidates will be balloted for. That is a mistake. Of course there is no balloting at all. The words should have been "the election of candidates will be proceeded with." I have altered the Resolution accordingly. It will be proposed by Major Holden.

Major R. HOLDEN, F.S.A., 4th Bn. Worcestershire Regiment:—

I must first express my regret that the officer who was invited to propose this Resolution is unable to be present. The Secretary, I know, took some pains to

secure a person of distinction, connected with the Militia Service, to perform the duty—Colonel the Rt. Hon. C. Seale-Hayne, M.P., Paymaster-General, and Colonel of the 3rd Bn. Devonshire Regiment—but he was unable, at the last moment, to be present, so I hope that you will excuse my endeavouring to occupy his place. The Motion is "That the thanks of this Meeting be given to the Members of the Council who, having served three years thereon, now retire, namely:—(Naval) Captain S. M. Eardley-Wilmot, R.N.; (Military) General Sir Redvers H. Buller, V.C., K.C.B., Adjutant-General; Major Viscount Dillon; Lieut.-General W. H. Goodenough, C.B., R.A.; Colonel Malcolm S. Green, C.B.; Colonel Lonsdale A. Hale, late R.E.; Colonel C. G. Slade, Commandant, Hythe; Colonel J. B. Sterling, Coldstream Guards; General J. T. Walker, C.B.; and that the election of candidates be proceeded with in accordance with section 4, paragraph 4, of the Bye-laws." A Resolution of this kind is not unfrequently looked upon as more or less of a matter of form, and sometimes justly so. But in this particular instance there are more than ordinary grounds for our expressing our thanks to the retiring members of the Council, whose names I have just mentioned. Without in any sense detracting from the known services of Lord Dillon, General Walker, Colonel Slade, and Colonel Green to this Institution, or inviting comparisons, it would at the same time be unjust to forget the distinguished services which some of the others have rendered. We all know that a few years ago the Council had the reputation, just or unjust, of being a little behind the times. It was not universally considered that they had proceeded with that vigour which was necessary for the well-being of the Institution, and it stands out prominently that certain members of the Council, in view of that feeling, and their own idea of what was required, took a very leading part in advocating a policy of progress and greater activity, with admirable results; and I feel it only right that we should acknowledge our indebtedness to those retiring members of the Council for their assistance in bringing about that very satisfactory state in which, as General Erskine has fully explained, the Institution is now in. Perhaps I may be forgiven for saying that if there is one member of Council in particular to whom the Members of this Institution, and both Services in this country, are indebted for the great progress which has been made in connection with the Institution in recent years, that man is Colonel Lonsdale Hale. (Cheers.) To Colonel Hale is due the credit of having secured the appointment of the Special Committee which has produced nearly all the reforms that have emanated lately from the Council; and in this good work he has been ably and loyally backed up by three of his colleagues on that Committee whose names appear on the list of members retiring from the Council: I allude to Captain Eardley-Wilmot, R.N., General Goodenough, and Colonel Sterling. I feel sure that it would have been of great advantage to the Council of the Institution if the rules had enabled them to retain the services of these four members, to whom, under the able chairmanship of General Erskine, we are indebted for the reforms now in course of progress, so that they might have assisted to carry them out in their entirety. It is possible that we may see them re-elected. Gentlemen, I have much pleasure in proposing a hearty vote of thanks to each of the retiring members of Council for their services to the Institution, and that the election of the officers to fill their vacancies be proceeded with.

Captain ANGOVE, R.N.R.:—

Mr. Chairman and Gentlemen,—I have much pleasure in rising to second this Proposition, "That the thanks of the Institution be given to the members of the Council," and I also take this opportunity to express a hope and a desire that I may see before very long an officer of the Royal Naval Reserve a member of this Council. (Cheers) Several members of the Royal Naval Reserve, who belong to this Institution as Members, fully appreciate the privilege, and I shall use my best endeavours to increase the number, especially after what I have heard at this Meeting to-day. (Cheers.)

The Resolution having been put from the Chair, was declared by the Chairman to have been carried unanimously.

The CHAIRMAN:—

The Scrutineers appointed to look through the votes are Rear-Admiral Stewart and Major Holden.

Admiral Sir GEORGE WILLES, G.C.B.:—

I fail to see why, because our Chairman is also the Chairman of the General Meeting, there should not be placed on the agenda paper a vote of thanks for him. I, for my part, have a great deal more pleasure in proposing a vote of thanks to the Chairman proper, because he has, as we know, borne "the burden and heat of the day" for the last year, with great patience and ability. (Cheers.) There is a very proper regulation "That the Chairman should be, alternately, a Naval and a Military officer, I think that it is a very excellent rule, and should only be departed from under special circumstances. But it appears to me that it is undesirable that we should this year change our Chairman. (Cheers). This is not the day for the election; but all that I can say is that I should be very glad if, when the time comes, it is proposed to break through the usual rule and to elect our worthy Chairman for another year. Of course, I say this with the understanding that Admiral Boys consents to such an arrangement. I now move a vote of thanks to our Chairman, not only for his conduct in the chair to-day, but for his valuable services during the past year. (Cheers.)

Lieut.-General GOODENOUGH, C.B, R.A.:—

I second this Motion as a member of the sister Service, it having been proposed by the Admiral. The Proposition is, "That a hearty vote of thanks be accorded to General Erskine for his conduct in the Chair to-day." We cannot dismiss from our minds his activity, and his personal influence upon the work of the Council over which he has presided as Chairman during the whole year. Recent reforms in this Institution have been alluded to, and one—and I think that we have a remarkable proof of its success—has been touched upon by Sir George Willes to-day. It was that, instead of having a Chairman who was not intimately associated with the working of the Institution, we should have one who was so. Usually, we have had His Royal Highness the Commander-in-Chief, our President, who does take a great interest in all the affairs of the Institution (cheers), and at his back we have the Chairman of the Council proper. I second this Motion most cordially, being fully aware myself, from my position on the Council, of the devotion—'assiduity" would be no word for it—devotion to the interests of the Institution, which has been displayed by General Erskine. (Cheers.) His loyalty to the Council on all occasions is extreme. I say "extreme" advisedly, because I think that sometimes he sacrifices himself, or rather does not lead as much as he might, but defers always to the voice of the Council.

Admiral BOYS (Vice-Chairman):—

Gentlemen,—I believe that it will be my duty to put this Resolution to the Meeting for their sanction. I would only point out that the election of a Chairman rests, by our Bye-laws, with the Council; and I am sure that, when the time comes, Sir George Willes's views, and what he has expressed, will not be forgotten.

The Motion was submitted by the Vice-Chairman, and carried unanimously.

The CHAIRMAN:—

Gentlemen,— I beg leave to return you my thanks for the Resolution which you have just passed, and also for the very kind way it was proposed and seconded by the two gentlemen who took the Resolution in hand. All I can say is, that whatever I have done for the Institution, I have done as a matter of loyalty to the Council, of which I have been a member for many years. It has always been a satisfaction to me to carry out what I have considered best for the interests of the Institution, and as long as I am able to work for it I shall be very glad to do so. (Cheers.)

PUBLICATIONS PURCHASED AND EXCHANGED DURING 1893.

ALMANACS, GUIDES, &c.—

A B C Railway Guide.
Aldershot Monthly Directory.
Army and Navy Calendar.
Boyle's Court Guide.
Bradshaw's Monthly Railway Guide.
British Almanack and Companion.
British Postal Guide.
Burke's Peerage.
Clergy List.
De Gotha Almanack.
Hazell's Annual.
Incorporated Law Calendar.
Kelly's Post Office Guide.
Medical Directory.
Nautical Almanack.
Oliver and Boyd's Edinburgh Almanack.
Royal Blue Book.
Whitaker's Almanack.
Woolwich Monthly Directory.

INSTITUTIONS AND SOCIETIES.

Aldershot Military Society.
Anthropological Institute.
Antiquaries, Society of.
British Association.
Civil Engineers, Institution of.
East Indian Association.
Electrical Engineers, Institution of.
Iron and Steel Institute.
Junior Engineering Society.
Manchester, Literary and Philosophical Society of.
Manchester Tactical Society.
Mechanical Engineers, Institution of.
National Society for Aid to Sick and Wounded.
National Rifle Association.
Naval Architects, Institution of.
North of England Mining and Mechanical Engineers.
Royal Agricultural Society.
Royal Archæological Institute.
Royal Artillery Institution.
Royal Asiatic Society, Bengal Branch.
Royal Asiatic Society, Bombay Branch.
Royal Astronomical Society.
Royal Colonial Institute.
Royal Engineers' Institute.
Institutions, &c.—(contd.).
Royal Geographical Society.
Royal Humane Society.
Royal Institution.
Royal National Life-Boat Institution.
Royal Statistical Society.
Royal Society of Edinburgh.
Royal Society of Great Britain.
Sanitary Institute of Great Britain.
Shipwrecked Fishermen and Mariners' Society.
Society of Arts, &c.
United Service Institution of India.
Victoria Institute, London.
Zoological Society Journal.
" " Transactions of.

PERIODICALS.

Daily—
Daily News.
Daily Telegraph.
Globe.
Morning Post.
St. James's Gazette.
Standard.
Times.
Weekly—
Admiralty and Horse Guards Gazette.
Homeward Mail.
Army and Navy Gazette.
Athenæum.
Broad Arrow and Naval and Military Gazette.
Colonies and India.
Engineer, The.
Engineering.
Invention.
Iron.
Lancet, The.
Nature.
Naval and Military Record and Dockyards Gazette.
Notes and Queries.
Saturday Review.
United Service Gazette.
Volunteer Service Gazette.
Monthly—
Jackson's Woolwich Journal.
Knowledge.
Metforological Office, Publications.
Nautical Magazine.

PERIODICALS—(contd.).
- PHILOSOPHICAL MAGAZINE, LOND., EDIN., DUBLIN.
- SHIPPING WORLD.
- UNITED SERVICE MAGAZINE.

VOLUNTEER SERVICE MAGAZINE.
- WESTMINSTER REVIEW.

Quarterly—
- ASIATIC REVIEW.
- EDINBURGH REVIEW.
- QUARTERLY REVIEW.

NAVAL AND MILITARY LISTS—
- ARMY LIST, MONTHLY.
- „ OFFICIAL, QUARTERLY.
- ARMY LIST, HART'S ANNUAL.
- NAVY LIST, MONTHLY.
- NAVAL AND MILITARY LISTS—(contd.).
- NAVY LIST, ROYAL QUARTERLY.
- ARTILLERY LIST, ROYAL MONTHLY.
- „ „ „ QUARTERLY.
- ENGINEERS' LIST, ROYAL MONTHLY.

MISCELLANEOUS—
- ANNUAL REGISTER.
- DEPARTMENT OF DIRECTOR OF MILITARY EDUCATION, EXTRACTS OF PROCEEDINGS OF.
- ORDNANCE COMMITTEE, EXTRACTS FROM THE ANNUAL REPORT OF THE PRESIDENT.
- PROFESSIONAL PAPERS, ROYAL ENGINEERS, S.M.E., CHATHAM.
- STATESMAN'S YEAR-BOOK.

FOREIGN AND COLONIAL.

AMERICA, U.S.A.

- AMERICAN SOCIETY, CIVIL ENGINEERS.
- ARMY AND NAVY JOURNAL.
- BUREAU OF ETHNOLOGY, ANNUAL REPORT OF.
- NOTES ON THE CONSTRUCTION OF ORDNANCE.
- ORDNANCE NOTES.
- SCIENTIFIC AMERICAN.
- SMITHSONIAN INSTITUTE, ANNUAL REPORT OF.
- UNITED STATES ARTILLERY JOURNAL.
- UNITED STATES CAVALRY ASSOCIATION.
- UNITED STATES GEOLOGICAL SURVEY, REPORTS.
- UNITED STATES MILITARY SERVICE INSTITUTE JOURNAL.
- UNITED STATES NAVAL INSTITUTE JOURNAL.
- UNITED STATES UNITED SERVICE MAGAZINE, THE.

AUSTRIA.

- MITTHEILUNGEN AUS DEM GEBIETE DES SEE-WESENS.
- MITTHEILUNGEN ÜBER GEGENSTÄNDE DES ARTILLERIE- UND GENIE-WESENS.
- ORGAN DER MILITÄR-WISSENSCHAFTLICHEN VEREINE.

AUSTRALIA.

- ROYAL SOCIETY OF NEW SOUTH WALES, JOURNAL.
- UNITED SERVICE INSTITUTION OF NEW SOUTH WALES, JOURNAL.
- UNITED SERVICE INSTITUTION OF VICTORIA, JOURNAL.

CANADA.

- CANADIAN SOCIETY OF CIVIL ENGINEERS, PROCEEDINGS OF.
- CANADIAN MILITARY INSTITUTE, TRANSACTIONS.
- GEOLOGICAL AND NATURAL HISTORY SURVEY, REPORT OF.
- QUEBEC LITERARY AND HISTORICAL SOCIETY, PROCEEDINGS OF.
- ROYAL SOCIETY OF CANADA, PROCEEDINGS OF.

FRANCE.

- ANNUAIRE DE LA MARINE.
- ANNUAIRE DE L'ARMÉE FRANÇAISE.
- JOURNAL DES SCIENCES MILITAIRES.
- L'AVENIR MILITAIRE.
- LE SPECTATEUR MILITAIRE.
- LE YACHT.
- REVUE D'ARTILLERIE.
- „ DE CAVALERIE.
- „ DES DEUX MONDES.
- „ DU CERCLE MILITAIRE.
- „ MARITIME ET COLONIALE.
- „ MILITAIRE DE L'ÉTRANGER.
- „ DU GÉNIE MILITAIRE.
- „ DU SERVICE DE L'INTENDANCE MILITAIRE.

GERMANY.

- ARCHIV FÜR DIE ARTILLERIE- UND INGENIEUR-OFFIZIERE DES DEUTSCHEN REICHSHEERES.
- JAHRBÜCHER FÜR DIE DEUTSCHE ARMEE UND MARINE.
- JAHRESBERICHTE ÜBER DIE VERÄNDERUNGEN UND FORTSCHRITTE IM MILITÄRWESEN.
- MARINE-RUNDSCHAU.
- MILITÄR LITERATUR-ZEITUNG.
- „ WOCHENBLATT.
- NEUE MILITÄRISCHE BLÄTTER.

ITALY.

- RIVISTA MARITTIMA.
- „ MILITARE ITALIANA.
- „ DI ARTIGLIERIA E GENIO.

JAPAN.

SEISMOLOGICAL SOCIETY TRANSACTIONS.

RUSSIA.

MILITARY SCIENCE AND LITERATURE, MAGAZINE.
DITTO NAVAL.
ARTILLERY JOURNAL.
ENGINEER JOURNAL.
MILITARY JOURNAL.

SPAIN.

REVISTA GENERAL DE MARINA.
MEMORIAL DE INGENIEROS DEL EJÉRCITO.
REVISTA TÉCNICA DE INFANTERIA Y CABALLERIA.

SWEDEN.

KONGL. KRIGSVETENSKAPS-AKADEMIENS HANDLINGAR OCH TIDSKRIFT.

SWITZERLAND.

REVUE MILITAIRE SUISSE.

MAPS, PLANS, CHARTS, &c.

Purchased and Presented during 1893.

Pilot Chart of the North Atlantic Ocean, 1893. Monthly sheets.
By the U.S. Naval Depart., Washington.

Wreck Chart of the North Atlantic Coast of America.
By the Hydrographic Office, U.S. Navy.

Topographical Atlas of Switzerland (*in continuation*).
By the Swiss Govt.

Topographical Atlas of Denmark (*in continuation*).
By the Danish Govt.

Universal-Administrativ-Karte der Österreich-ungarischen Armee, 1892.

Carte du Dahomey, 1893.

The Universal Atlas, 1893.

Stanford's Chart, Naval Manœuvres, 1893. *Purchased.*

Map of N.E. Morocco and Adjoining Territory, 1892.

Map of Basutoland, 1888.

Map of the Surveyed Portion of British-Bechuanaland, 1892.

Massi-Kessi and Surrounding Country, 1892.

Anglo-Portugese Boundary, E. Africa, 1892.

Ibea Railway Survey, Mombasa-Victoria Nyanza, 1893.

Maps, showing routes of Captain Lugard, in Uganda and Unyoro, 1893.

Mombasa-Victoria Lake Railway, 1893.

Map, Autumn Manœuvres, 1893.

Map of part of Sierra Leone, showing Routes from Lokko to Interior.

Plan of Melilla and Country Adjoining.
By the Intel. Dien., W.O.

MUSEUM.

Presented, 1893.

Medal, struck by the Art Union of London, 1849, in commemoration of Inigo Jones, bearing on the reverse side a representation of the Banqueting House.
Presented by Colonel Hennell, D.S.O.

Model of H.M.S. "Eurydice."
Presented by Admiral of the Fleet, Sir J. E. Commerell, V.C., G.C.B.

Very fine model of Ship made of bone by a French prisoner.

Axe taken from a dead man's hand by John Rashleigh Rodd, Esq., Mate of H.M.S. "Princess Charlotte," when sent on shore for boat service at Acre.
Presented by Mrs. Rashleigh Rodd.

Sea Chest, formerly the property of John Adams, one of the mutineers of H.M.S. "Bounty," with bottle and piece of his hair. These relics were given to the Rev. W. H. Holman, R.N., Chaplain of H.M.S. "Portland," on his leaving Pitcairns Island, in 1853, by George Adams, son of John Adams.
Presented by The Rev. W. H. Holman, R.N.

Collection of Japanese Weapons, consisting of—
2 Inlaid Matchlocks.
2 Shields.
3 Helmets.
3 Swords.
3 Large Inlaid Pikes.
Presented by C. Douglas, Esq.

The Additions (Books) to the Library will be issued yearly in the form of the Library Catalogue.

PARLIAMENTARY PAPERS RECEIVED DURING 1893.

[C-6793.] Report, Railways in India, 1891-92.
[C-6844.] Report, Electrical Communication with Lighthouses and Light-Vessels.
[C-6859.] 5th Report, Education of Officers.
[C-6860.] Yeomanry Cavalry Training Return, 1892.
[C-6861.] Establishment of each Regiment of Militia in the United Kingdom, 1892.
[C-6875.] Report, Board of Visitors, R. M. Academy, Woolwich, 1892.
[C-6879.] Ditto Ditto R.M. College, Sandhurst.
[C-6901.] Annual Return, Volunteer Corps in Great Britain, 1892.
[C-6906.] Annual Report, Inspector-General of Recruiting, 1892.
[C-6911.] Memorandum of the Secretary of State relating to the Army Estimates for 1893-94
[C-6954.] Reports from Her Majesty's Embassies in Austria-Hungary, France, Germany, and Italy on the Civil Employment of Soldiers and Sailors on completion of Service.
[C-7017.] 5th Report on Army Schools, 1893.
[C-7147.] General Annual Return, British Army, 1892.
[C-7049.] 31st Report, Patriotic Fund.
[C-7175.] Report, Military Prisons, 1892.
[C-7176.] Report, Board of Visitors, R.M. College, Sandhurst, 1893.
[C-7177.] Ditto Ditto R.M. Academy, Woolwich, 1893.

77. The late Hostilities on the N.W. Frontier of India, Conclusion of Treaties with the Maharajah Dhuleep Sing of Lahore and the Maharajah Golab Sing of Jummoo, 1846.
85. Papers respecting the late Hostilities on the N.W. Frontier of India, 1846.
Papers relating to Punjab, 1847-49.
22. Army (Courts-Martial). A Return of Courts-Martial in each Regiment, 1893.
32. Military Forces Localization, Account, 1891-92.
41. Chelsea Hospital, Account, 1891-92.
49. Army (Ordnance Factories) Appropriation Account, 1891-92.
56. Army Appropriation Account, 1891-92.
82. Imperial Defence Act, 1888, Ports and Coaling Stations.
85. Navy Estimates, 1893-94.
87. Supplementary Army Estimates, 1892-93.
88. Army Estimates, 1893-94.
143. Annual Accounts, Royal Army Clothing Factory, 1891-92.
144. Annual Accounts, Ordnance Factories, 1891-92.
166. Return, Number and Cost of Guns supplied to the Naval and Land Services during 1891-92.
189. Return, Number of Commissions given since Abolition of Purchase.
234. Army (Military Savings' Banks).
317. Return of Officers holding Civil Employment of Profit under Public Departments.
339. Army (Men available for Indian Service).
360. Soldiers and Sailors (Civil Employment).
380. Return of Officers holding the Honorary Rank of Colonel and Pay attached.
421. Return of Cost on Army Votes of Army Medical Staff during the Twenty Years 1874-75 to 1893-94.